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Volume 11 - Number 2

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WORLD'S POULTRY SCIENCE JOURNAL

Volume 11 April-June Number 2

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EGG PRODUCTION IN 1954 AND CURRENT CHICKEN NUMBERS IN SPECIFIED COUNTRIES*

Egg production in the reporting countries of the world continued its upward trend in 1954 for the third straight year. Again as in 1953 North America and Europe were the principal world suppliers of eggs.

The Netherlands, Denmark, Ireland, Canada and the United States were large exporters of eggs. Present indications point to an expanded output in 1955 by various European countries, but total production for the reporting countries should be about the same as 1954. The egg-feed price relationship in Europe is expected to be quite favorable during 1955.

Total chicken numbers in the major producing countries in 1954 changed slightly. However, chicken numbers expanded significantly in Denmark, Netherlands, Western Germany, Canada and the United States. Noted reductions, partly because of the uncertainty of the United Kingdom market, occurred in Ireland, Australia, the Union of South Africa and the United Kingdom itself.

The United Kingdom is the largest importer of eggs in the world and de-control of its egg trade in March 1953 affected its suppliers in 1954. On January 1, 1954 United Kingdom contracts for eggs and poultry products with countries in the sterling area were terminated.

Egg production in Ireland, Union of South Africa and Australia was reduced but exporters still faced uncertainty because of the lack of a steady export market. Thus flock-size readjustments took place. Denmark and the Netherlands on the other hand expanded their production. Also Denmark in 1954 renegotiated an egg-delivery agreement with the United Kingdom.

Egg production in Denmark continued to rise in 1954 in spite of a poor 1953 grain harvest. During calendar year 1954 Denmark imported a total of 1,023,574 tons of breadgrains and feedgrains to meet its human consumption and livestock feeding programs. In addition in 1954 it imported 706,660 tons of feedstuffs, primarily oilseed cake.

In 1954 both poultry numbers and egg production increased in the Netherlands. The number of chickens on Dutch farms in December 1954 totaled over 20 million, an increase of more than 400,000 over December 1953. Hatching during

EGGS

Number produced[1] in specified countries, averages 1934-38, 1946-50; annual 1952-54

Continent and Country	Average 1934-38	Average 1946-50	1952	1953	1954
	Million	Million	Million	Million	Million
North America					
Canada—Farm	2,638	4,015	3,984	4,086	4,420
Canada—Total	2,863	4,382	4,104	4,200	4,547
Mexico	——	——	——	2,080	2,400
United States—Farm	35,498	56,535	60,985	61,704	64,260
Europe					
Austria	663	369	785	845	845
Belgium	1,693	1,584	2,030	2,175	2,325
Denmark	1,979	1,447	1,968	2,155	2,357
France	6,200	6,580	7,000	7,000	7,200
Germany, Western	3,700	2,655	5,300	5,500	6,000
Greece	550	388	490	525	550
Ireland	1,086	893	972	980	840
Italy	5,500	4,380	5,550	5,600	5,850
Netherlands	1,978	1,189	2,570	3,130	3,750
Norway	369	283	392	420	437
Sweden	1,000	1,288	1,370	1,375	1,380
Switzerland	423	486	518	520	536
United Kingdom:					
Farm[2,3]	[3]3,871	2,880	4,700	4,600	4,650
Total[2,3]	[3]5,098	4,590	6,300	6,200	6,250
Other Countries					
Turkey	1,003	859	980	——	1,000
Japan	3,553	970	4,676	5,140	5,340
Philippine Islands	[4]738	567	950	1,015	1,050
Argentina	1,127	——	3,000	3,150	3,500
Brazil	——	——	3,730	3,800	4,380
Peru	——	——	——	——	440
Uruguay	——	289	——	330	320
Egypt	751	[5]694	520	525	530
Union of South Africa[6]	——	——	955	970	900
Australia[7]	708	1,418	1,230	1,230	1,200
New Zealand	430	[8]146	[8]185	[8]190	[8]190

[1] Relates to farm production in the United States but many countries not explicit on this point. [2] Years ending May. [3] Three-year average. [4] 1938. [5] For 1947. [6] Years ending June. [7] Commercial production for years ending June 30. [8] Receipts at Marketing Department Stations, year ending March, which account for 30-40% of total production.

the 1953-54 season was sharply increased and about 38 million chicks were raised.

Very exacting culling is practiced in the Netherlands by experienced poultry keepers and trained assistants of the Poultry Extension Service. Therefore, the expansion of hen numbers is controlled. The Dutch Extension Service's efforts to improve care for poultry, feeding and sanitary conditions, have been successful during the past few years as smaller margins between the cost price and the marketing price have

CHICKENS

Continent and Country	Date Applicable 1	Average 1934-38	Average 1946-50	1952	1953	1954
		Thousands	Thousands	Thousands	Thousands	Thousands
North America						
Canada	Dec. 1	44,077	45,245	42,717	38,500	40,000
Mexico	March	[2]36,368	——	——	——	60,000
United States	Jan. 1	408,177	465,503	449,925	429,731	442,813
Europe						
Austria	Dec. 3	[3]8,862	5,640	8,200	8,600	8,800
Belgium	Dec. 31	16,500	14,069	15,000	15,000	——
Denmark	July	[3]27,643	22,030	23,411	24,251	25,234
Germany, West.	Dec.	51,225	——	50,676	51,344	55,234
Greece[4]	Nov. 30	11,679	8,366	10,010	11,614	12,500
Ireland	June	15,961	16,677	16,287	16,195	13,000
Netherlands	Dec.	[3]29,632	——	15,816	15,709	19,778
Norway	June 20	5,868	4,617	——	4,887	——
Sweden		[6]10,980	12,467	11,091	10,932	11,158
Switzerland	April	75,544	5,674	6,260	6,200	6,300
U. Kingdom—Farm	June	73,402	77,153	90,422	87,516	80,389
Yugoslavia	Jan.	18,000	[7]17,330	18,340	17,225	22,400
Other Countries						
Turkey		16,764	18,811	21,700	21,320	——
Japan	July	51,094	17,192	30,273	36,586	41,805
Philippine Islands	Dec. 31	25,365	15,766	32,090	36,444	40,000
Brazil		——	——	——	——	127,000
Peru		——	——	——	——	11,600

[1] Year end estimate (October-December) shown under following year for comparison. Thus for Canada the December 1, 1952 estimate is shown under 1953. [2] 1940. [3] Average 2-4 years only. [4] All poultry. [5] June 6 Sept. 1937, June 1946-1949, April 1950-52, census estimates include layers and chicks. [7] 1936. [8] 1949-1950.

stimulated Dutch farmers to carry out suggestions to improve breeding and management techniques.

Selection has been an important element in the increase of hen egg production in the Netherlands. The major factor, however, which places Dutch poultry among the highest producers in the world, is the rigidly controlled breeding program at about 200 licensed breeding farms throughout the country. Production per hen during 1954 averaged 192 eggs. Total output is calculated at 3,750 million eggs, a gain of about 650 million over 1953.

The United Kingdom's egg production continued to increase in 1954, further replacing imports which are now less than half their prewar level. As market uncertainties have led

to a reduction of hen numbers in 1954, egg production is not expected to increase in 1955.

In Latin America estimates of poultry numbers and egg production are not readily available. It may be said, however, that the production of both poultry and eggs increased in Mexico, Cuba, Jamaica, Colombia, Brazil and Venezuela.

It is estimated that by mid-1955 the number of hens in Mexico will be about 26 million; the total number of chickens about 60 million and the total of all poultry at 64 million head. Egg production in Mexico for 1954 is estimated at 2.2 billion eggs, and for 1955 is forecast at 2.5 billion eggs.

The poultry industry in Brazil made some progress in 1954 despite difficulties of a short feed supply and the threat of Newcastle disease. Brazil's poultry population at the end of 1954 is estimated at 140 million chickens compared to 127 million at the beginning of 1954. The total number of turkeys, geese and ducks are believed to be about the same.

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* This is one of a series of regularly scheduled reports on world agricultural production approved by the Foreign Agricultural Service Committee on Foreign Crops and Livestock Statistics. It is based in part upon reports of U.S. foreign agricultrual officers. A summary of this information was published in the April 4, 1955 issue of *Foreign Crops and Markets.* (Foreign Agriculture Circular FPE8-55, Apr. 18, 1955, U.S. Dept. of Agriculture, Foreignu Agricultural Service, Washington, D.C.)

POULTRY INDUSTRY DISTINGUISHED SERVICE AWARDS—1955

Poultry Association of Great Britain (SPBA) initiated three years ago the presentation each year of not more than three awards for distinguished service in, or to, the poultry industry over a long period of years. The award consists of a bronze medal and parchment citing the award.

The Council of the Association has decided to make three awards for the current year. They go to:

1. Mr. J. E. Wilson, B.Sc., M.R.C.V.S., F.R.S.E., for distinguished service over a long period of years in the fields of poultry pathological work and poultry disease research.

2. Mr. Wm. Evans, N.D.P., for distinguished service over a long period of years in the field of poultry advisory work.

3. Mr. John R. Harvey, F.C.I.S., for distinguished service over a long period of years in the fields of administration and advisory work.

Mr. J. E. Wilson is now in his 29th year of his work in connection with poultry. He qualified as a Veterinary Surgeon in July, 1926 at the Royal (Dick) Veterinary College, Edinburgh, and graduated with a B.Sc., in veterinary science at Edinburgh University. Mr. Wilson was an assistant in practice at Brigg in Lincolnshire and Coventry in Warwickshire until his appointment early in 1927 as Assistant to the Professor of Pathology and Bacteriology at the Royal (Dick) to take charge of the newly created department of poultry diseases. The work of this department expanded rapidly during the following years. In 1939 when the Ministry of Agriculture and Fisheries established the veterinary laboratory at Lasswade to do poultry work for Scotland, Mr. Wilson was appointed to take charge of it and has held the post continuously since then.

The principal investigations he has carried out in the realm of research are those into Salmonella infections of chicks and their control, particularly with regard to incubator fumigation and fowl paralysis. Work carried out at the laboratory under his direction was the first to establish in the U.K. that salmonellosis was commonly spread in the incubator, and thus suitable steps for fumigation were needed and were duly applied.

In 1940 he became a Fellow of the Royal Society of Edinburgh. He is President of the Scottish Branch of the British Veterinary Association and is a Past President of the Scottish Metropolitan Division of the British Veterinary Association. He is a Member of the Council of the World's Poultry Science Association and on the Executive Committee of the British Branch. For many years he was an Examiner for the National Diploma in Poultry. Mr. Wilson has contributed many articles to veterinary periodicals.

Mr. William Evans, who is the Provincial Poultry Officer for Wales, was trained at the National Institute of Poultry Husbandry, Harper Adams College. In 1929, he became County Poultry Instructor for Carmarthenshire and resided at Pibwr Lwyd Farm Institute, lecturing to students and in charge of the Institute's Poultry Plant. While there, he set up the first Egg Laying Trials for the county.

In 1931, Mr. Evans was appointed Commercial Poultry Instructor for Glamorganshire and was responsible for the Poultry Plant at the County Demonstration Farm. In 1940, he was seconded to the Glamorgan War Executive Committee

and was made District Agricultural Officer in charge of the Bridgend district until 1942, when he became Small Livestock Inspector for the whole of Wales under the Ministry of Agriculture, and in 1945 took over his present post as Provincial Poultry Officer for Wales.

Mr. Evans is the Ministry's representative for Wales on the National Poultry Diploma Examinations Board and has served as Examiner for the Board on some occasions.

He is keenly interested in the Young Farmers' Club movement and has often acted as judge for that body at county rallies and national shows.

Mr. John R. Harvey has served the poultry industry, up to this year, for 25 years, during which time he has been an officer of Poultry Association of Great Britain, devoting himself whole-heartedly to the work of the organization for the industry. He has been its general secretary for about 15 years.

Mr. Harvey is a Devonian and on leaving school spent some time as a student on a farm in that county. Later he entered the animal feedingstuffs trade and was engaged in it for about 10 years, leaving it to join Poultry Association of Great Britain in an administrative and advisory post. His whole career has had connection with agriculture in one way or another.

For some years he kept a small flock of poultry — R.I.R.'s.

Mr. Harvey has made contributions to the press and journals continuously from the day he left school. He wrote in the first place extensively on business administration, commercial law, economics and accountancy, and later turned more particularly to agricultural subjects and marketing. He holds many certificates for examination successes including a silver medal for the 1st place in the U.K. (Commerce).

In the 1930's he was on occasions seconded by the Association for special tasks in connection with co-operative producer-owned egg packing station movement.

He has been prominent in any moves for publicity for eggs and poultry during recent years.

Mr. Harvey has never given time or trouble any thought in serving the industry and the Association.

B.O.C.M. POULTRY AWARD FOR 1954

The B.O.C.M. Poultry Award for 1954 was presented at a luncheon on April 7th in London to Major Ian Macdougall, Secretary and Assistant-Treasurer of the World's Poultry Science Association.

Although given primarily for his work at the Edinburgh Congress last year, the presentation was intended to mark a period of over 30 years' unbroken service to the Industry.

Major Macdougall first came into prominence as assistant to Sir Edward Brown (then Mr.) on the National Poultry Council in the early 1920s. He succeeded Sir Edward as secretary and remained in that capacity until joining the Domestic Poultry-keepers' Council early in the war as deputy central organizer. When the N.F.U. formed its Poultry Branch he took over the secretaryship, a post he still holds.

At Edinburgh last year he was secretary of the British National Committee which organized participation in the Congress. This was his fifth occasion in that capacity—in Germany in 1936, U.S.A. 1939, Copenhagen 1948 and Paris in 1951. Following the Paris Congress, he was appointed Chevalier du Merite Agricole by the French Government.

Major Macdougall (left), receiving the B.O.C.M. Trophy from Mr. Esmond Robinson, vice-chairman of B.O.C.M.

The B.O.C.M. Award was instituted by the British Oil & Cake Mills Ltd. in 1953 for oustanding services to the Poultry Industry in Great Britain: It takes the form of a very large silver cup which is held for one year at the end of which time the holder is presented with a replica. The first award for 1953 was given to Dr. H. Temperton of the National Institute of Poultry Husbandry at Harper Adams Agricultural College.

CHICKEN LICE CONTROLLED OR ERADICATED BY LINDANE

Lindane emulsions, properly applied to laying houses as sprays at 0.5 percent gamma isomer or with a brush at 1.25 percent gamma isomer, eradicated or controlled chicken lice in field trials carried out in cooperation with South Dakota poultrymen. These control measures are apt to be most effective when applied in the fall, when the lice are at a very low ebb, and success in completely eradicating or effectively controlling them can be reasonably expected. At that season only 18 out of 31 flocks of chickens in South Dakota were infested with 1 to 3 different kinds of lice, only 3 flocks harboring the 3 kinds. The body louse was found in 13 flocks, the shaft louse in 8 flocks, and the fluff louse in 9 flocks, the first-named pest occurring in the largest number, and the last-named in the smallest number. Pullets brought in from the summer range were generally free of lice, whereas old hens and pullets in close contact with them harbored large numbers. In a flock of old hens that had been housed all summer, individual birds harbored as many as 10,000 to 15,000 shaft lice.

Field trials, involving 1,300 chickens in 6 small farm flocks, showed that an emulsion containing 0.5 percent lindane properly sprayed so as to cover the roosts, perches, and floors of the laying houses, eradicated the body louse and shaft louse but only reduced the infestations with the fluff louse. A 1.25 percent suspension of lindane applied with a brush gave practically similar results. In cage tests involving 1.2 percent lindane sprays, it was found that the application was 100 percent effective during the first 48 hours after spraying, gradually losing its effectiveness during the next 48 hours, and being almost ineffective thereafter. At a concentration of 0.3 percent lindane, the effectiveness of the spray was practically lost after 48 hours. (Report of the Chief of the Bureau of Animal Industry (1953), U. S. Department of Agriculture, Washington, D. C.)

INFLUENCE OF THE RATION ON GIZZARD DEVELOPMENT IN CHICKENS*

G. F. HEUSER

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Differences are noticeable in the size and condition of the gizzards of birds. This leads one to ask why this should be so. Undoubtedly there are a number of factors which have an influence on the development of the gizzard. One of these factors is the contents of the gizzard during growth. This would include the kind of materials or feeds as well as the amounts of the same. The amounts of feed which the gizzard must handle will depend upon the food consumption. The amount of food consumed is related to many factors, such as rate of growth, the amount of fiber or bulk in the ration, and the energy value of the ration. Another factor which will influence the development of the gizzard is the use or activity of this organ. The extent of the activity of the various tissues will have its effect.

A number of observations can be made in respect to gizzard development. Some of these can be used as measures of comparison. The weight of the gizzard has reference to the weight of the organ without the gizzard contents. This might be expressed as actual weight or as a percentage of the total body weight. The diameters of the gizzard can also be measured. The width and length usually refer to the diameters taken through the wide and narrow axes. The gizzard muscle can also show differences in development. The thickness of the gizzard muscle as measured by the widest diameter in cross section is a measure of size. The weight of the gizzard muscle, which refers to the weight of the gizzard minus the gizzard lining, may be an expression of size as well as compactness of the muscle. The gizzard lining can show differences in respect to weight as well as to the nature of its surface.

A number of investigators have made reference to this difference in gizzard development. Waite (1935) in reporting miscellaneous studies on poultry grit, states that there is "some indication that grain particles themselves are capable of exerting a very considerable crushing effect on each other when under pressure and when wet."

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*Paper presented at Grit Seminar held under the auspices of the Granite Grit Institute of America at Boca Raton, Florida, Nov. 11-12, 1954.

Platt and Stephenson (1935) reported that the gizzards of 12-week old birds which had received 6.5% of mica or combined mica and limestone grits in the feed were heavier, wider and thicker than gizzards of birds that received 3.3% of grit, or less. The gizzards of birds receiving 6.6% of mica grit in their feed as compared with those of birds receiving no grit showed increases of 8.7% in gizzard width, 4.7% in gizzard thickness, and 14.4% in the gizzard muscle thickness. The birds receiving the grit were heavier but also ate more feed. The feed efficiency was approximately the same for both groups. The authors concluded that a determining factor in the gizzard development was how much grit the gizzard retained.

Bird and associates (1937) in studying gizzard erosion in chicks observed an abnormal thickening or swelling of the gizzard lining (distinct from crater lesions) to occur in young chicks fed a finely ground, gritless ration. The condition may be prevented by feeding grit or a coarsely ground ration. Thompson and Wilcke (1941) also studied gizzard erosion and concluded that "grit or oat hulls prevented swollen linings. Oat hulls produced large gizzards with linings almost free from corrugations."

Mangold and Damköhler (1938) concluded with small numbers of birds that the development of the gizzard and its lining differed so considerably within every group that no valid conclusion could be drawn. Their data, however, suggest greater gizzard weights and lining weights for the birds receiving grit.

MacIntyre and Cameron (1951) reported larger gizzards for birds receiving oyster shells plus silica grit *ad libitum* as compared with birds receiving only the oyster shells. The increase was 23.7% in gizzard volume and 18% in gizzard weight.

A number of studies conducted at Cornell University, Heuser (1941) and Heuser and Norris (1946), have included observations on gizzard development. In Table 1 are given the average values for Single Comb White Leghorns on a weighted basis for males and females for two groups of birds, one of which received an all-mash ration and the other a grain-mash ration. It will be noted that all of the measurements are greater for the grain-mash fed birds. The greatest differences are in the thickness of the gizzard muscle and the weight of the gizzard muscle. The grain-mash birds were 3.1% heavier in respect to live weight whereas the weight of the gizzard was

TABLE 1

Gizzard development of birds fed grain and mash compared with that of birds fed an all-mash ration

	Grain and mash	All-mash	Difference in favor of grain-mash Actual	%
Number of birds	29	28	—	—
Live weight (pounds)	3.36	3.26	0.10	3.1
Weight of gizzard (grams)	41.4	38.6	2.8	7.3
Diameter of gizzard (millimeters)				3.6
Large	51.7	49.9	1.8	
Small	26.4	26.1	0.3	1.2
Thickness of gizzard muscle (millimeters)	19.0	17.0	2.0	11.8
Weight of gizzard muscle (grams)	26.4	23.7	2.7	11.4

7.3% greater, the weight of the gizzard muscle 11.4% greater and the thickness of the gizzard muscle 11.8% greater for this group.

In Table 2 are given the data for two groups of Leghorns hatched in April and killed at the age of three months. One lot received grit *ad libitum* whereas the other lot did not. The measurements of the lot receiving grit were greater in all cases. The greatest differences were found in the weight of the gizzard and the weight of the gizzard muscle. The birds receiving grit weighed 4.5% more than those not receiving grit. The large and small diameters of the gizzards were respectively 18.5% and 12.7% greater, the thickness of the gizzard muscle 19.9% greater, and the weights of the gizzard and gizzard muscle 50.0% and 40.8% greater, respectively, for the

TABLE 2

Gizzard development of birds fed grit compared with that of birds not receiving grit

	Grit	No grit	Difference in favor of grit Actual	%
Number of birds	19	29	—	—
Live weight (pounds)	2.79	2.67	0.12	4.5
Weight of gizzard (grams)	41.4	27.6	13.8	50.0
Diameter of gizzard (millimeters)				
Large	53.7	45.3	8.4	18.5
Small	26.7	23.7	3.0	12.7
Thickness of gizzard muscle (millimeters)	20.5	17.1	3.4	19.9
Weight of gizzard muscle (grams)	26.9	19.1	7.8	40.8
Range				
Weight of birds (pounds)	2.20-3.35	2.10-3.15		
Weight of gizzard (grams)	29-55	22-34		
Diameter of gizzard (millimeters)				
Large	16-25	41-50		
Small	48-60	22-27		
Weight of gizzard muscle (grams)	24-30	15-24		
Thickness of gizzard muscle (millimeters)	17-37	13-20		

birds receiving grit. These comparisons bear out the observation that the gizzards of the birds receiving grit were not only larger but were more compact as well. There exists some relation between the weight of the bird and the weight of the gizzard. The correlation was greater, however, in the case of the birds receiving grit, the coefficient of correlation being 0.72 ± 0.08 as compared with a coefficient of correlation of 0.40 ± 0.13 for the birds not receiving grit.

Table 3 shows the influence on gizzard development of 5% of granite grit in the feed of Single Comb White Leghorn cockerels as compared with gizzards of birds receiving no grit. All of the measurements are greater for the birds receiving grit, with the exception of the weight of the birds. In this experiment the birds receiving the grit weighed 6.2% less than the birds not receiving grit. The birds were battery reared to 8 weeks of age. The greatest difference was in the weight of the gizzard lining, showing an increase of 105.8%. The gizzard lining represented 39% of the total gizzard weight of the birds receiving grit as compared to 27% for those not receiving grit. The weight of the gizzard and the weight of the gizzard muscle showed increases respectively of 43.5% and 20.1%. The small and large diameters of the gizzard were increased respectively 12.8% and 15.8%, whereas the thickness of the gizzard muscle showed an increase of only 2.1%.

Hill and Dansky (1954) reported on experiments con-

TABLE 3

Influence of grit on gizzard development

	5% Granite grit in mash	No grit	Difference in favor of grit Actual	%
Number of birds	16	16	—	—
Live weight—8 weeks (grams)	742	791	−49	− 6.2
Weight of gizzard (grams)	36.3	25.3	+11.0	+ 43.5
Weight of gizzard muscle (grams)	22.1	18.4	+ 3.7	+ 20.1
Weight of gizard lining (grams)	14.2	6.9	+ 7.3	+105.8
Diameter of gizzard (millimeters)				
Large	46.8	40.4	+ 6.4	+ 15.8
Small	25.5	22.6	+ 2.9	+ 12.8
Thickness of gizzard muscle (millimeters)	14.9	14.6	+ 0.3	+ 2.1
Grit content (grams)	9.9	—	—	—
Range				
Live weight (grams)	645-920	610-870		
Gizzard weight (grams)	30-43	21-29		
Weight of gizzard muscle (grams)	18-27	15-23		
Weight of gizzard lining (grams)	10-19	6-10		
Gizzard diameter (millimeters)				
Large	45-51	35-46		
Small	23-28	21-25		
Thickness of gizzard muscle (millimeters)	13-20	10-19		

TABLE 4

Influence of oat hulls on gizzard development

No. of groups	Oat hulls	Body weight	Gizzard weight	Feed	Gizzard % of body wt.
3	%	gm	gm	gm	%
2	0	1460	25.0	4279	1.71
3	9-10	1496	28.9	4680	1.93
2	17-23	1482	32.0	5006	2.17
1	29-30	1425	34.0	5248	2.38
1	40	1371	38.0	5329	2.77
	50	1207	38.4	5678	3.18
Difference between 0 and 50%		21% dec.	54% inc.	33% inc.	86% inc.

(Hill and Dansky, 1954)

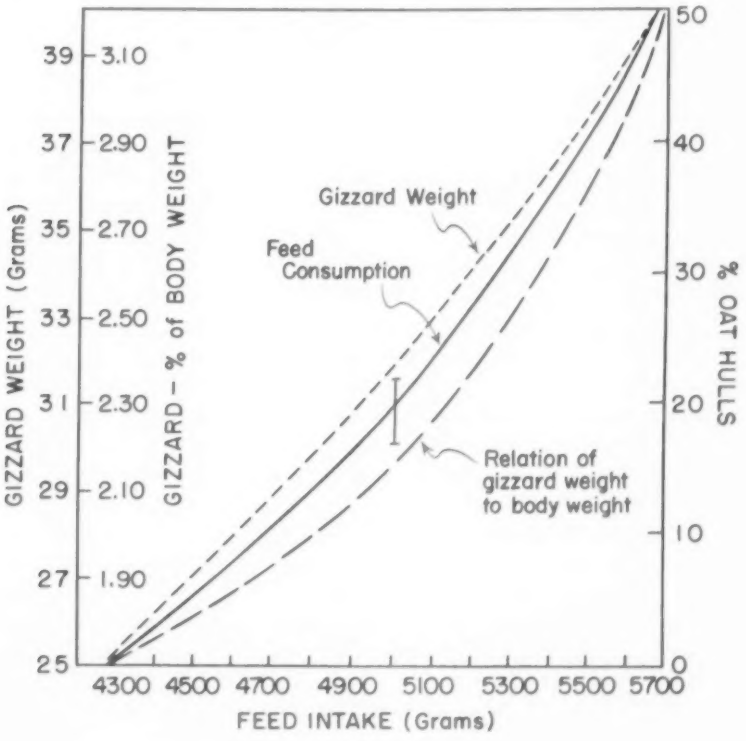
ducted at Cornell dealing with the effect of dietary energy level on growth and feed consumption. The energy level was varied by including finely ground oat hulls in varying amounts up to 50%. Observations were also made on gizzard development as expressed by the weight of the gizzard. The results are shown in Table 4 and Figure 1. There is not much effect on body weight until the oat hulls constitute more than about 30% of the ration. On the other hand, there is a fairly constant increase in feed consumption with the increase in the percentage of oat hulls in the diet. The weight of the gizzard as expressed in actual weight or in per cent of body weight shows a close relationship with feed intake. Comparing the response of the ration without oat hulls with that containing 50% oat hulls, we find the following values: a decrease in body weight of 21% with an increase in feed consumption of 33%; an increase in the actual gizzard weight of 54%, with an increase of the per cent of gizzard to body weight of 86%.*

These results would indicate that the nature of the feed as well as the amount of feed passing through the digestive tract has an influence on the development of the gizzard of growing birds. There seems to be a difference of the effect, depending upon the hardness and solubility of the materials present in the gizzard. Whole grain has some effect on gizzard development although this is not very great. The gizzard is also developed by having larger quantities of feed pass through it and going through the grinding process as is the case with high fiber, low energy rations. However, dependence

*Scott, M. L., E. R. Holm, and R. E. Reynolds also report that gizzard weight of pheasants increased as the level of oat hulls in the diet increased. (Studies on pheasant nutrition. 2. Protein and fiber levels in diets for young pheasants. Poultry Science 33:1237, 1954.)

upon such rations is not the best method to develop gizzards because of other limitations of such rations. The presence of grit in the gizzard, particularly hard grit, seems to have the greatest effect upon gizzard development.

Another question might well be: To what degree is it necessary or desirable to develop the gizzard and the gizzard muscles? Will birds raised without grit and having smaller and weaker gizzards be handicapped in their future handling of feed, and hence in production? It is reasonable to assume that a bird with a well developed gizzard will have a biological advantage and be in a better position to meet variable and exacting conditions. The bird with the smaller gizzard development might function satisfactorily if all conditions are favorable, such as the feeding of an all-mash ration of high energy value and the lack of consumption of coarse materials such as whole grain, grass, litter, feathers and the like, which need grinding. The presence of coarse particles in the gizzard will stimulate activity and gizzard development. This development is most marked when such particles are hard, as in the case of grit, and particularly insoluble grit.



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PURE OR CROSSBRED BIRDS

In Belgium and in Holland, the practice of crossing two breeds has increased very considerably in recent years. Actually 60% of the laying birds in Holland were crossbreds during 1953 as against only 12% in 1949. In Belgium, the situation is similar; 40% of the breeders producing crossbred chicks for commercial purposes. In both countries, there is a preference for the first cross between a light and a medium-sized breed.

Tests in Holland covering 600 poultry enterprises have given superior production for the crossbreds over the purebreds ranging from 1 to 10% depending upon date of hatch. Most of these comparisons were between crosses of White or Exchequer Leghorns on Rhode Island Reds in comparison to the purebreds of the above cross. In addition to the above, in Belgium for two years, tests on a large scale have been conducted to determine the value of double cross (Hy-line) compared to the purebreeds of the country when carried under the same environmental conditions.

It is anticipated that at least three years' results will be required before conclusion can be drawn from these tests.—(F. C. Lievens)

PROTEIN AND VITAMIN SUPPLEMENTS IN CHICK RATIONS

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In pre-war days, poultry rations in South Africa consisted chiefly of maize, oats, wheat by-products, lucerne or alfalfa meal and carcase or meat meal. At present, carcase meal is only available in limited quantities and hence fishmeal is used extensively. Soybean meal cannot be obtained for animal feeding as it is used for fortifying human food. Dried buttermilk is being manufactured but the retail price is too expensive for the feeding of animals. A small percentage of this product is undoubtedly valuable in chick starting mashes and may justify the additional expense. Dried brewers yeast is used as a source of B-vitamins but the increased demand for patients in hospitals has encouraged the production of Fermavite for animal feeding. This latter product is obtained from the fermentation of sugar cane molasses.

Numerous experiments have been conducted in various countries on the feeding value of a variety of protein and vitamin sources. These results have been of considerable value in the manufacture of better balanced rations. The quality of the products is by no means uniform depending upon the source of supply and the various manufacturing processes. It is essential that the biological value of these food products should be determined at periodic intervals.

On the 29th July, 1952, an experiment was started with 8 groups of White Leghorn chicks. The chicks were selected at random and each group contained 46 individuals which were fed the following basal ration: 52 lb. yellow maize meal, 10 lb. wheaten bran, 7 lb. lucerne meal, 4 lb. peanut oil cake meal, 3 lb. dried brewers yeast, 2 ounce magnesium sulphate, 2 ounce common salt, 1 ounce manganese dioxide, 1 lb. oyster shell, ½ lb. bone meal and 4 ounce fish oil. For the first two weeks the chicks were kept in a battery brooder and thereafter they were reared in the brooder house. The protein supplements consisting of White fishmeal and dried buttermilk. The weighted live-weights of male and female chicks at 6 weeks of age are given in Table 1.

Group	Rations	Average live weight (gm.)	Gramme food per gramme gain
1	Basal + 14 lb. fishmeal	445.4	2.98
2	Basal + 14 lb. buttermilk	431.7	2.80
3	Basal + 4 lb. fishmeal + 10 lb. buttermilk	473.0	2.73
4	Basal + 7 lb. fishmeal + 7 lb. buttermilk	475.6	2.65
5	Basal + 10 lb. fishmeal + 4 lb. buttermilk	498.1	2.41
6	Basal + 14 lb. fishmeal	467.7	2.79
7	Basal + 14 lb. buttermilk	420.5	2.70
8	Basal + 7 lb. buttermilk + 7 lb. fishmeal + 22 gm. methionine	494.3	2.82

From the table it will be seen that the best growth was obtained from rations 5 and 8. There was no significant difference at P = 0.01 between these two groups at 6 weeks of age. The growth on rations 2 and 7 were unsatisfactory and showed quite clearly that dried buttermilk cannot replace white fish meal on an equal basis. Schaible 1949 indicated that skimmed milk may be relatively low in glycine and arginine but it contains a surplus of lysine and tryptophane. March, Biely and Young 1950 obtained excellent results in the feeding of fish meal to chicks. When their fishmeal ration was supplemented with 1 gm. of lysine per lb. of ration growth was improved but the increase was not significant. From the analysis by March and co-workers it is quite clear that fishmeal is lower in lysine and arginine than meat scraps but in tryptophane, methionine and cystine fishmeal is of higher value than meat scraps. Our basal ration contained peanut oil cake which is a good source of arginine.

Each ration was supplemented with 2 ounces of magnesium sulphate as fishmeal contains approximately three times less of this mineral than carcase meal and maize nearly 5 times less than wheaten bran. The rations 3 to 8 inclusive were supplemented with 2 ounces each of wheat germ oil. In various experiments at this Institution proof has been obtained that high maize rations supplemented with fishmeal often produce a type of crazy chick disease when maize germ and peanut meal is included. In none of the chicks in this experiment was there any indication of vitamin E deficiency or exudative diathesis. On ration 6 (fishmeal) a growth response was obtained in the presence of wheat germ oil but not on ration 7 where dried buttermilk was fed.

In the second experiment dried buttermilk, brewers yeast and Fermavite were tested as sources of the B vitamins. The White Leghorn chicks for this experiment were pur-

posely hatched late in the season (Southern hemisphere) on 6th November, 1952, and each group consisted of 40 chicks selected at random. Late hatched chicks are more likely to develop vitamin deficiencies than early hatched reared during the cool months when they normally consume food more readily than in warm weather. The basal ration was the same as in experiment 1 except that fishmeal (14 lb. in each ration except group 5) was fed as the source of protein and each ration was supplemented with 2 gm. of folic acid.

The different supplements and the weighted live weights of males and females at 6 weeks of age are given in Table 2.

Group	Rations	Average live weights (gm.)	Gramme food per gramme gain
1	Basal + 3 lb. buttermilk	490.7	2.37
2	Basal + 3 lb. brewers yeast	490.6	2.71
3	Basal + 3 lb. Fermavite	417.2	2.84
4	Basal + 3 lb. buttermilk + 22 gm. methionine	421.4	2.86
5	Basal + 7 lb. fishmeal + 7 lb. hoof and horn meal + 3 lb. Fermavite	402.0	2.80
6	Basal + 3 lb. Fermavite + 4 oz. "Egg a Day"	477.2	2.75
7	Basal + 3 lb. Fermavite + 75 gm. Aurofac	493.5	2.56
8	Basal + 3 lb. Fermavite + 150 gm. Aurofac	467.7	2.81

Good growth was obtained on rations 1, 2, 6 and 7. In general the growth response on Fermavite was not as good as on dried buttermilk and brewers yeast. In previous tests at this Institution (1950) equal quantities of Fermavite and brewers yeast gave better growth than either of the products fed separately. The liquid solvents of sugar cane molasses again gave superior results than the dried products. It is possible that the drying process of this vitamin source can be improved so that the B vitamins are not inactivated or destroyed.

The poorer growth of the chicks on ration 4 cannot be explained especially since fish meal plus buttermilk and methionine gave excellent results in group 8 experiment 1. Evidently the chicks in all groups did not react in exactly the same manner although they were kept in adjacent groups under the same environment.

The poor growth on ration 5 can be attributed to the hoof and horn meal in the ration. This product was ground finely and did not inhibit food consumption. When Fermavite was supplemented with Aurofac (group 7) the growth was

the same as those in group 1 fed dried buttermilk. With the higher level of Aurofac no advantage was gained in growth.

"Egg a Day" is a proprietary mixture containing about 34 per cent protein and consists of animal by-products, trace minerals and spice. In an experiment with laying hens it was found that this product stimulates food consumption and egg production during the winter period. Although the chicks fed "Egg a Day" were not as heavy as those fed dried buttermilk, dried brewers yeast and Aurofac they were not significantly lower in live body weight than any of these groups.

Combs and co-workers 1948, found that the addition of 2 per cent of fishmeal to a basal soybean oil meal ration increased growth and feed efficiency. They obtained evidence that fish meal contains a growth essential which is not identical with any of the presently recognized B-complex vitamins or amino acid required by the chick. Branion and Hill 1953, also indicated that fishmeal contains an unknown growth factor or factors. In the review given by Branion and Hill similar results have also been obtained by other investigators and these references need not be repeated in this discussion.

The results obtained in this investigation indicate that dried buttermilk cannot be fed as the chief source of concentrated protein in chick starting mashes. If the milk is replaced by 50 per cent or more of white fishmeal better growth can be expected in chicks. As a source of B-vitamins, dried buttermilk was not significantly superior to dried brewers yeast neither to Fermavite plus Aurofac nor to Fermavite plus "Egg a Day."

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UNIDENTIFIED GROWTH FACTOR IN EGG YOLK?

Does egg yolk contain a growth factor—one previously unrecognized?

It's surprising that something may have been missed in the much-worked-over egg. Yet, U.S. Agricultural Research Service poultry investigators C. A. Denton, R. J. Lillie, and J. R. Sizemore find that chicks respond to yolk in their diet.

They have also found, along with other researchers, that growth can be stepped up by including lard.

And chicks fed both egg yolk and lard make remarkable gains on less feed than birds on an ordinary diet.

These discoveries grew out of efforts to estimate the amount of vitamin B_{12} in egg yolks. Chicks need this vitamin for top growth, and research shows it's carried over from hen to chick through the egg.

The scientists tried two methods of estimating egg-yolk B_{12}. One test uses B_{12}-hungry bacteria, the other chicks. In both cases, their growth is first measured on diets containing known amounts of pure, crystalline B_{12}. This provides standards with which to compare growth on the same diets with B_{12}-carrying egg yolk added instead of the pure vitamin.

Bacteria and chicks gave the same results with pure B_{12} in the diet. On the diet with yolk in it, however, the chicks showed B_{12} values 8 to 10 times greater than the bacteria. Apparently, the chicks were responding to something else in the yolk besides B_{12}. What was it?

Denton and his associates now put some chicks on a basal diet with everything chicks are known to need—except animal protein and an unidentified factor in fish solubles.

A second group got this same basal diet plus 4 per cent fish solubles. These chicks gained 9 per cent more.

Thinking that fat's high-energy value might be involved —egg yolk is 30 per cent fat—the scientists tried another group of chicks on the basal diet plus 8 per cent lard. This increased growth 6 per cent.

With 10 per cent egg yolk in the basal diet, growth jumped 17 per cent.

And adding all three increased growth 32 per cent—which equals the sum of 9 (from fish solubles), 6 (from lard), and 17 (from egg yolk).

So we seem to be dealing with three separate growth stimulators:

1. Fish solubles. Adds animal protein and an unidentified factor.

2. Lard. Adds energy and may increase the feed's palatability. This suggests an outlet for animal fats.

3. Egg yolk. Adds energy—plus something else (yolk from many sources gave similar results). It may be a known egg component that hasn't been recognized as a growth factor.

Denton, Lillie, and Sizemore are attempting to identify the egg-yolk factor, which might be obtained from a cheaper source. Keep in mind that their experiments have been made in the laboratory with small numbers of birds. Chicks probably wouldn't give such exceptional responses under ordinary conditions.

But eventually this research could pay off in more efficient feeds. (Agricultural Research, U.S.D. Agr., Washington, D.C.)

BELGIUM—THE PRODUCTION YEAR OCTOBER, 1953 - SEPTEMBER, 1954

The Poultry Journal, "Nutpluimvee," official organ of the Flemish Provincial Societies of Utility Poultrymen, publishes in its issue of December, 1954, a study on the relation between the price of feeds and the price of eggs for the laying year, October, 1953 to September, 1954.

Price of feed: To calculate this, the prices of mash and grain feeds for layers were used as follows:

The average price per 100 kilograms of mash—446 Francs
The average price per 100 kilograms of grain—448 Francs
The average price per 100 kilograms of feed (50:50)—447 Francs

Price of eggs: This price is calculated on the basis of the egg market of Kruishoutem, the largest egg market in Belgium and based on a production of 145 eggs per bird per year for a flock composed of 60% pullets and 40% adult birds. The average price is calculated to be 2.14 Francs per egg for the laying year 1953-54.

Ratio between price of feed and eggs: This relationship is used as a basis for comparison of production in different years. It is calculated by dividing the average price for 1 Kgr. of feed by the average price of 1 egg. This calculation gives the following ratios:

1953-54—2.09
1952-53—2.14
1950-51—2.34

The laying year 1953-54 has been more favourable with respect to the price ratio of feed to eggs than previous years. In order to purchase 1 Kgr. of feed, it has been necessary to provide 2.09 eggs as against 2.34 eggs in 1950-51 and 2.14 eggs in 1952-53.

WORLD'S POULTRY SCIENCE LIBRARY

Reviewer:

W. D. TERMOHLEN

American Embassy
APO 500, % Postmaster
San Francisco, California, U.S.A.

POULTRY FARMING FOR A LIVING, Cyril Grange. Macmillan and Company, London, 1954. 266 pages; price $2.50

This is a practical and plainly written book which should be helpful to the novice who is thinking about engaging in poultry keeping, and also the experienced poultryman. The author started poultry-keeping as an ex-serviceman in 1919. He has been a successful pedigree poultry breeder, winner of many awards at shows and tests. He has held a number of offices in poultry production and marketing associations. Consequently he speaks with experience and authority. The book has been written for the purpose of helping others. The contents consist of 16 chapters of sound advice. The first chapter "Primary considerations" is said by the author to be the most important, "For it concerns the making of the decision to adopt a proposition which must provide for a happy life or to give up a safe job for the unknown (at least, at the start)." He states that poultry farming has had a magnetic attraction to people of all ages and professions but that too often the lure of the hen has resulted in disaster. He advises anyone who is contemplating becoming a poultry farmer to give the matter complete and careful consideration to the most minute detail. He lists seven factors for success and seven factors which will probably result in failure. This first chapter in itself is worth the price of the book and can apply any place in the world. The second chapter gives sound suggestions regarding "Locality and Site." Chapter III covers "Choice of Branch" and what this choice depends on. Chapter IV covers "Choice of systems," naming seven and listing advantages and disadvantages of each. Chapters V through XI cover the production aspect, including housing, breeding, incubation, brooding and feeding. Chapter XII covers marketing and salesmanship, and Mr. Grange states in 30 years of visiting poultry farms he gained the impression that most owners took little interest in marketing, put no value on publicity, showed no enthusiasm for salesmanship and paid scant attention to a simple but sufficient system of accounts. He insists that the business side of poultry farming is as im-

portant as the production part. Chapter XIII is entitled Publicity, Advertising, Records and Staff, and is packed with good advice.

Chapter XIV covers "Disease" and the author says, "No other livestock enterprise could thrive if it suffered the mortality of poultry." He lists 12 items by which he says disease can be successfully combatted, one being immunization by vaccination which he suggests for fowl pox but for Newcastle he backs the ban on imports of poultry and the slaughter of infected flocks as better than vaccination. From this it can be gathered he is a believer in egg and poultry meat self-sufficiency as a possibility for the United Kingdom.

The book ends with a chapter on subsidiary enterprises, a glossary of technical terms and an index.

POULTRY KEEPING IN THE TROPICS, V. F. K. Ayivor and C. E. K. Hellins. Oxford University Press. London—1953. 64 pages.

The authors, an African and a European, are both experienced farmers. It is a revision of Miss Hellins' Poultry Keeping. The book is written in simple and plain language. It has a useful purpose for the small farmer who does or should raise a small flock of poultry for egg and meat purposes. The 13 short chapters cover breeds and types of poultry, system of poultry keeping, housing, equipment, selection (especially culling for egg production) hatching, rearing, feeding, diseases and general management.

For areas of the world where poultrykeeping is less advanced and not commercialized this book can be very useful. Small farmers could well have it for reference. Its greatest value would probably be in teaching in mass education and rural training centers. It could well be used for example by persons carrying on an activity such as the Point 4 work sponsored by the United States of America Government.

(May be obtained from V. F. K. Ayivor, Achimota School, Achimota, Gold Coast, West Africa, at a price of 2/6d, postage 4d.)

FIND YOUR CAREER IN THE POULTRY INDUSTRY, prepared by the Committee on Poultry Careers for the Poultry Science Association—J. H. Florea, Editor; Interstate Printers and Publishers, Inc., Danville, Ill.—47 pages—1954.

The $4 billion poultry industry of America requires the services of thousands of trained people and the recruitment of several hundred trained individuals annually. This booklet is the result of the efforts of a Committee on Poultry Careers

established by the Poultry Science Association in 1951. The value and importance of the poultry industry are covered in 8 pages and prepared by Professor Raymond Cray of Ohio State University.

Opportunities in the poultry industry are briefly covered and 29 pages are devoted to careers in Poultry Husbandry under headings—Public service, Feed industry, Processing and marketing, Hatching business, Veterinary service, Journalism. The last two pages cover "Where to get more information."

This booklet should be utilized by all teachers of agriculture and made available to their students.

MARKETING OF AGRICULTURAL PRODUCTS, by Max E. Brunk and L. B. Darrah. The Ronald Press Company, New York, N.Y. 1955. 419 pages. Price $5.50

This book is a refreshing approach to providing students of agriculture background information essential to understanding the complexities of the marketing system and to prepare them to appreciate the importance of marketing to agriculture in all its branches and phases. It has a definite place in the course work of all agricultural economics students. It should be required reading of all students of poultry husbandry because the time is long past when so little emphasis, as is still true, should be given to this study by poultry students to enable an understanding of the marketing process. In this day and age it is essential that both undergraduate and graduate students, even to do a good job on production, must have a far better knowledge of the marketing process than in the past.

Today's specialized and mass production techniques make it essential to know the end use of the industry's products. In the end the "consumer is boss" and there has been too often neglected or by-passed by some segments of the poultry industry, both production and marketing. This book is interesting and refreshing because the authors give special attention to the economics of consumption, a phase of economics which too many production and even economics teachers minimize or neglect through either lack of knowledge, lack of appreciation or unwillingness to recognize the hard economic facts of life.

The authors, both professors of marketing at Cornell University, are modern and practical in their ideas. They have used this book in its preliminary form for several years at Cornell University. Based on classroom experiences, students'

suggestions, and the experience of the authors in working with marketing agencies and governmental departments, the book has been revised several times before its initial publication. The book consists of 23 chapters divided into 5 parts. I—Introduction; II—Factors affecting the consumption of farm products; III—Factors affecting the supply of farm products; IV—Adjustment of consumption and supply; V—Marketing agencies, channels and costs. The term "marketing" as used in this book describes a series of "services" involved in getting goods from the "point of production" to the "point of consumption."

In the preface the authors state, "The book is based on the conviction that the real spark of value in a course in agricultural marketing comes from giving the students a grasp of the whys of the marketing process. With this in mind we have given special attention to the economics of consumption emphasizing those characteristics of consumers and the trade which are so influential in setting the pattern for both production and marketing." The authors have done just this by covering material concerning consumer behavior, buying practices and food habits. The services which have been performed by the consumer are considered and this is generally neglected. The authors show why food consumption varies from family to family, from one day to another, from one section of the country to another. They have covered the fact that there is a market for both high and low quality products. The variations in consumption and production which influence many marketing functions are explained and how these functions bring consumption and production into balance. A real foundation for the treatment of the mechanics of marketing is presented in the book. The emphasis has been given to the practical rather than the theoretical and academic.

This book is highly recommended to all teachers of agricultural marketing and poultry husbandry.

FEEDING POULTRY, Second Edition, by Gustave F. Heuser. John Wiley and Sons, Inc., New York, and Chapman and Hall, Ltd., London. Pages 632. 1955. Price $7.50

"Feeding Poultry" is one of the *must have books* for the student, research worker and teacher in the field of poultry husbandry. It is so packed with valuable information, so authoritative, so handy as a reference because of its arrangement that its time saving ability makes it worth many times its cost. It is a book which also should be in the personal library, for current use, of at least commercial producers,

feed dealers and hatcherymen.

This second edition has been revised throughout and it makes available the new knowledge on feeding developed in recent years, at least into 1954. For example: material on antibiotics is covered in an up-to-date way. The author on page 47 says, "One of the most spectacular recent developments in nutrition science is the discovery that antibiotics have growth-stimulating properties when fed to chickens, turkeys and swine. Few nutritional discoveries have been so generally and universally applied to feeding practice. The finding came as a result of the use of by-products from antibiotic production as sources of vitamin B_{12}."

All phases of the science and practice of poultry feeding relating to poultry nutrition and management have been covered by the author who has had nearly forty years of teaching, research and extension work in poultry husbandry, most of which has been spent in the field of poultry feeding. The author has had broad experience, not only in the United States, but world-wide because of his active work with The World's Poultry Science Association. This has enabled him to travel extensively and visit farms, experiment stations and educational institutions, not only in the United States and Canada but Europe as well. He has attended eight out of the ten World's Poultry Congresses. How painstaking and thorough his work has been in the preparation of this book is indicated by the amount of reference material. At the end of each chapter references on specific phases or subjects are given and for the 19 chapters there are 1252 such references. However, this number can be misleading since while in some instances a reference refers to only one specific piece of work or referral, in others it is many more. For example, in the case of antibiotics the one reference contains a list of 38 reports of research. It can be estimated that there are over 3600 actual references listed. Reference lists cover 146 of the 525 pages of text or over 25 percent.

The first chapter clearly outlines the feeding problem. The second chapter covers the objects and principles in poultry feeding. The third chapter covers the composition of plants, animals and rations. Chapter four deals with measuring the value of feeds.

The types of poultry feeds are thoroughly covered in chapters 5, 6, 7 and 8. The factors which must be considered in making a poultry ration are very clearly and expertly explained in chapter 9. Various systems and practices of feed-

ing are covered in chapter 10 such as whole grain, ground grain, all-mash, pellets, kernels, free-choice, hopper, wet vs. dry mash, range vs. confinement, feed restriction, etc., with advantages and disadvantages of each listed. Chapter 11 covers feeding and its relations to health. Feeding and management of chickens is dealt with in chapters 12-15, turkeys chapter 16, waterfowl chapter 17, and other species of birds including pheasants, quail, pigeons and canaries in chapter 18. The text of the book very logically ends with a chapter on the economics of feeding which covers such phases as feed required by chickens to produce a dozen eggs or a pound of meat.

A very valuable part of the book is an appendix of about 100 pages in which are given representative rations for the definite purposes of feeding young chickens, layers, breeders, fattening, and also turkeys and ducks. The use of local grain is also covered.

It can thus be seen that the question of feeding poultry is given complete coverage and why your reviewer concludes that the ownership of this book is a must for students, teachers, research workers, and many others connected with the poultry industry.

IMPROVED TURKEY SLAUGHTER

An improved method of turkey slaughter, combining humaneness with quality protection, has been found to have commercial possibilities in research recently completed by the Biological Sciences Branch of the Agricultural Marketing Service, USDA. The process provides for completely immobilizing the birds before they enter the processing line by gassing them with carbon dioxide (CO_2).

Further research is underway on the practical application of the method in turkey processing plants to perfect it for commercial use. Studies so far, under actual plant operating conditions, have shown that turkeys can be immobilized effectively with carbon dioxide gas when the proper combinations of gas concentration and exposure time are used.—(Marketing Activities Nov. 1954, U.S. Dept. of Agr., Agricultural Marketing Service, Washington, D.C.)

REVIEW OF POULTRY PUBLICATIONS

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GENETICS

NOTES ON THE POULTRY RESEARCH CENTRE FLOCK OF BROWN LEGHORNS. *World's Poult. Sci. Jr., 10:* 140-143.—The flock has been closed for over 20 yrs. Starting from the interbred progeny of a few foundation birds, obtained from widely different sources, 8 inbred lines were developed, each being selected for a different trait. In outward appearance the birds of a line now show noticeable similarity; besides morphological differences, there has also been considerable segregation in production traits. The behaviour of the latter in some interline crosses is mentioned. The degree of inbreeding has varied but all the lines showed a continuing decrease in body weight. Recent selection for size, however, resulted in recovery of much of the weight loss in the 5 larger lines. (Animal Breeding Abstracts)

BLYTH, J. S. S. 1953. (Poult. Res. Centre, Edinburgh.)
MARCH EGG NUMBER IN INBRED AND FIRST CROSS BROWN LEGHORNS. *Heredity, 7:* 23-30.—An analysis was made of March egg production in crosses between 2 inbred lines, B and I, the former a general purpose stock selected for a number of economic traits, the latter a stock selected for intensity of production. The heterotic effects in the first crosses were restricted to reduction in pausing and were not detectable in the basic rate of lay. (Animal Breeding Abstracts)

BOBBY, F. C. 1954. (Dept. Agric., Wellington.)
FIFTH LAYING TRIAL OF PROSPECTIVE POULTRY BREEDING STOCK. *N.Z. J. Agric., 88:* 423, 425-426.—Twenty-six pens each of 20 pullets were entered including 9 Australorp, 2 R.I.R., 1 Black Orpington and 14 White Leghorn. Flock-housed average was 177 eggs for the heavy breeds (181.2 for Australorp) and 145.7 for light breeds (W.L.) The W.L. figure is lower than in the previous 4 yrs., and was largely due to high mortality, 22.8% v. 15.8% for the heavy breeds. An appreciable number of birds, especially among the Australorp pens, laid small eggs (under 2 oz.) Two pens exceeded an average of 200 eggs in 48 wks. (Animal Breeding Abstracts)

BOBBY, F. C. 1954.
POULTRY FLOCK IMPROVEMENT PLAN: DATA ON AVERAGE EGG PRODUCTION AND POULTRY LOSSES. *N.Z. J. Agric., 88:* 545, 547.—In 1945 breeding flocks were first accredited in New Zealand under the Improvement Plan. A scheme, which is described, has now been introduced for assessing egg production efficiency in accredited flocks. In 1953-54 forty flocks were entered and 31 completed a 10-mth. recording period; of these, 14 White Leghorn and 7 Australorp flocks were in the North Island, and 8 W.L. and 2 Australorp flocks in the South Island. The W.L.'s averaged 143.8 eggs per pullet and the Australorps 159.9 eggs. Seventeen of the breeders (11 of W.L. and 6 of Australorp flocks) obtained a flock-housed average equal to, or greater than, the Dominion average. Total wastage accounted for 17.6% of the W.L.s and 15.1% of the Australorps. Forty flocks have been entered for the 1954 recording year. (Animal Breeding Abstracts)

BONADONNA, T. 1954. (1st. Sper. Ital. "L. Spallanzani" Fecond. Artif., Milan.)
LA REPRODUCTION CHEZ LES OISEAUX DE BASSECOUR. PROBLEMS THEORIQUES ET PRATIQUES. [REPRODUCTION IN DOMESTIC POULTRY. THEORETICAL AND PRACTICAL PROBLEMS.] *Ann. Nutr.* [*Paris*], *8:* 101-140. (B.)—A review. (Animal Breeding Abstracts)

BOYER, J. P., PERO, R., and COCHEZ, L. P. 1954. (Sta. Rech. Avicol., Jouy-en-Josas, Seine-et-Oise.)
LES PROBLEMES POSES PAR LA SELECTION DES VOLAILLES. [PROBLEMS IN THE SELECTION OF POULTRY.] *Ann. Nutr.* [*Paris*], *8:* 83-100.—The evaluation of characters, and the estimation of genotypes and heritability are described. (Animal Breeding Abstracts)

BRATANOV, K. 1954. (Bulgarian Inst. A.I. Livestock, Sofia.)
VEGETATIVNAJA GIBRIDIZACIJA U PTIC. [VEGETATIVE HYBRIDISATION IN BIRDS.] *Izv. Akad. Nauk SSSR, Ser. biol.*, 1954 (1): 53-58.—From 1st Feb. to 30th June 1953 blood (10cm.^{3}) from black turkeys was injected into 4 White Leghorn hens which were penned with a cock; another ♂ and 4 ♀ W.L.s served as controls. The erythrocyte number and haemoglobin content were greater in the injected birds. Between 1st April and 1st Oct. the injected hens averaged 82 eggs v. 59 for the controls. The eggs of the experimental birds averaged 66.5 g. and those of the controls 51 g.; the difference was due to the greater albumen content. There was no appreciable difference in the hatchability percentage. Chicks hatched in the experimental group were white with black patches; those in the control group were typical White Leghorns. (Animal Breeding Abstracts)

CHAMPION, L. R. 1954. (Michigan State Coll., East Lansing.)
THE INHERITANCE OF RESISTANCE TO CAECAL COCCIDIOSIS IN THE DOMESTIC FOWL. *Poult. Sci. 33:* 670-681.—Selective breeding was effective in establishing lines of chickens resistant and susceptible to caecal coccidiosis. Sex-linkage, maternal effect or cytoplasmic inheritance do not play a significant role in resistance or susceptibility to *E. tenella.* Resistance and susceptibility are controlled, in large part, by multiple genetic factors which do not exhibit dominance and presumably act in an additive manner. (Animal Breeding Abstracts)

CHARLET, P. 1954. (Inst. Nat. Agron., Paris.)
LES RACES DE POULE EN FRANCE, LEUR EVOLUTION. [FRENCH BREEDS OF FOWL, THEIR EVOLUTION.] *Ann. Nutr.* [*Paris*], *8:* 71-82. (Animal Breeding Abstracts)

COOPER, G. H., and HANHAM, D. P. 1954.
FINAL REPORT ON THE THIRTY-FOURTH ANNUAL SOUTHERN RHODESIA EGG LAYING TEST HELD AT GWEBI COLLEGE OF AGRICULTURE: 48 WEEKS. MARCH 1st, 1953, to JANUARY 30th, 1954. *Rhod. agric. J., 51:* 114-118.—Over the test period total egg production averaged 215.5 per bird. In the Heavy Breeds Section a team of R.I.R.s was best with an average of 256.4 eggs per bird. The winning team in the Light Breeds Section, in which only White Leghorns competed, averaged 211 eggs per bird. Overall mortality was 18%, which is much higher than the average. A graph showing results of the tests since 1937 reveals a greater av. improvement in production by the dual-purpose breeds since the war compared with that of the light breeds. (Animal Breeding Abstracts)

ERASMUS, J. E. (University of Stellenbosch.)
USEFULNESS OF PART-TIME PRODUCTION RECORDS IN LAYING HENS. *Farming in South Africa 29! 345:* 569-571, 1954.—The production records of 1163 White Leghorn hens consisting of full and half-sister groups were analyzed. For part-time production 1st July (Southern hemisphere) was chosen because at the date most hens are in production for a few months, winter pauses are included, day-length is

increasing and egg production is improving.

In this analysis it was necessary to select 19 per cent of the flock on 1st July to ensure that none of those constituting the best 10 per cent on 1st December would be excluded, that is, if selection is applied on an individual basis approximately twice the number of hens required for breeding may be selected on 1st July. The rating of families was not so easy as in individual selection. Although no general deductions can be made from the order of merit of individuals and families on 1st July and 1st December it is nevertheless an indication that if by the middle of the year the selection intensity is twice as low as is actually necessary, no valuable material will be lost but the saving in respect of labour will be considerable.—*(A. M. Gericke)*

GASEK, M. 1953. (Centr. Inst. Biol., Prague.) [Germany summary]
VEGETATIVNAJA GIBRIDIZACIJA ZIVOTNYH PUTEM SOEDINENIJA KROVO-OBRASCENIJA V TECENIE EMBRIONALJNOGA RAZVITIJA. [VEGETATIVE HYBRIDIZATION IN ANIMALS BY COMBINING BLOOD CIRCULATION DURING EMBRYONIC DEVELOPMENT.] *Cehoslov. Biol. 2:* 267-282.—When Pekin ducks and Leghorn chicks were joined in parabiosis by uniting the blood vessels for various periods during the incubation, an interchange of blood occurred. The growth and live weight of the Leghorns were greater than those of their controls. Similar parabiosis between Rhode Islands and White Leghorns resulted in morphological changes in the blood of the majority, and increased vitality and growth. One Rhode Island chick had abnormally coloured down; no feather changes were noted. Results are attributed to the interchange of blood before the formation of antibodies. (Animal Breeding Abstracts)

GERICKE, A. M. 1954. (Agric. Res. Inst., Pretoria.)
SYSTEMS OF POULTRY BREEDING. *Fmg S. Afr., 29:* 191-193, 196.—The different methods are described and their value considered in relation to large and small poultry flocks. Heritability of certain economic characters has been investigated, and the estimates are quoted as follows: hatchability 16%, viability 8-14%, sexual maturity 12-45%, egg production 16-47%, egg weight 46-84%, and body weight 32-75%.

At the institute at Pretoria, using the records of 6 daughters per dam, heritability of egg production was found to be 25%. For progeny testing in the Union the proposed period for control of hatching is Aug.-Sep., as hatching dates within these months have no significant effect on days to sexual maturity, or on winter and annual egg production. (Animal Breeding Abstracts)

GERICKE, A. M. 1953. (Agric. Res. Inst., Pretoria.)
COLOUR CHARACTERISTICS IN POULTRY. *Fmg S. Afr., 28:* 354-357.—Factors, including heredity, which affect the colour of skin, plumage, eyes and earlobes in domestic fowls are briefly surveyed. Although recognizing the difficulty in retaining a perfect breed standard, as defined in the Standard of Perfection, while selecting for economic qualities, it is emphasized that the purebred standards must be maintained in the interest of the Union's poultry industry. (Animal Breeding Abstracts)

GOODMAN, B. L., BRUNSON, C. C. and GODFREY, C. C. 1954. (Oklahoma Agric. Expt. Sta., Stillwater; Louisiana State Univ., Baton Rouge; and Oklahoma Agric. Exp. Sta., Stillwater.)
HERITABILITY OF 25-WEEK BODY WEIGHT IN TURKEYS. *Poult. Sci., 33:* 305-307.—Heritability estimates were calculated (on 2067 birds) for 25-wk. body weight in Broad Breasted Bronze and White Holland turkeys. The most reliable estimate appears to be about 0.30. (Animal Breeding Abstracts)

GOWE, R. S., and WAKELY, W. J. 1954. (Centr. Exp. Farm, Ottawa, and Poult. Branch, British Columbia Dep. Agric., New Westminster.)
ENVIRONMENT AND POULTRY BREEDING PROBLEMS. 1. THE INFLUENCE OF SEVERAL ENVIRONMENTS ON THE EGG PRODUCTION AND VIABILITY OF DIFFERENT GENOTYPES. *Poult. Sci., 33:* 691-703.—The birds used in the experiment were all

hatched at the same farm and distributed as day-old chicks to 5 farms during the 1st year of the experiment, and to 6 farms during the 2nd year. The farms were all in Canada but were located at widely separate points. Management and feeding procedures were standardized as far as was practicable. The investigation revealed a highly significant difference between stations in respect of mean hen-housed egg production and mean production of hens which survived the test year. Differences between sire progeny groups and between strains were also significant. Despite the highly significant differences in genotype and environment there was no significant interaction, under the conditions of the test, between strain and location in respect of hen-housed or survivor egg production or mortality. There was a highly significant difference between strains and between farms in mortality both during the rearing period and the laying period. (Animal Breeding Abstracts)

GULLIFORD, J. H. 1954.
RANDOM SAMPLE TESTS WITH PULLETS. With comment by V. H. BRANN. *Agric. Gaz. N.S.W., 65:* 261-263, 268.—The first test at Hawkesbury Agricultural College was held from Aug. 1952 to March 1954 with 6 groups of Australorps, White Leghorns and their crosses. Data on age at 1st egg and production are tabulated. Production was better, broodiness less, and mortality rate higher, in the W.L. ♂×Australoryp ♀ crossbreds than in the birds from the reciprocal cross. (Animal Breeding Abstracts)

HALE, R. W. 1954. (Queen's Univ., Belfast.)
HERITABILITY OF CHICK VIABILITY IN A WHITE WYANDOTTE FLOCK. *J. Agric. Sci., 44:* 221-226.—Over a 7-yr. period of selection 2 sections were established within the flock, showing, resp., high and low viability between hatching and (usually) 8 wks. age. During this period mortality in the high viability section decreased by about 40%. When all years and sections were pooled, total mortality to 8 wks. was found to have a low heritability in the flock (0.073 ± 0.005 between sires, 0.1429 ± 0.006 between dams, 0.1039 ± 0.006 joint.) The greater heritability between dams than between sires may be due to non-genetic maternal effects, such as differences among hens in the nutritive value of their eggs. The "between sires" estimate is regarded as more reliable. Although it is possible that heritability of viability in the brooder house may differ considerably from that at later stages, certain published figures for adult viability are very similar to those found in the above investigation. (Animal Breeding Abstracts)

HENDERSON, E. W. 1954. (Michigan Agric. Exp. Sta., East Lansing.)
INHERITANCE OF EGG WEIGHT AMONG PARENTS AND PROGENY OF A DARK CORNISH-WHITE LEGHORN RECIPROCAL CROSS. *Quar. Bull. Mich. Agric Expt. Sta., 36:* 462-468.—Spring egg weights of Dark Cornish-White Leghorn reciprocally crossbred pullet progenies were compared statistically with parental populations. Average egg weight of the populations was as follows: Dark Cornish 51 g. (σ 3.9); White Leghorn 57 g. (σ 4.1); F_1 reciprocal crossbred progeny 55 g. (σ 4.8). There was no significant difference between the mean egg weights of the reciprocal F_1 populations (W.L.×D.C. 54.8 g. and D.C.×W.L. 54.9 g.). Egg weight was not dominant, sex-linked, nor matroclinous. Heterosis was not evident. The superior value of the use of the standard deviation as a guide in selection practice over the population average alone was demonstrated. (Animal Breeding Abstracts)

HOFFMAN, R. 1954.
REINZUCHT ODER KREUZUNG IN DER LANDWIRTSCHAFTLICHEN GEFLUGELHALTUNG. [PUREBREEDING AND CROSSBREEDING WITH POULTRY]. *Tierzucht, 8:* 235-237.—Autosexing breeds in Germany and the genetic basis for autosexing are described. (Animal Breeding Abstracts)

HUTT, F. B. 1953. (Cornell Univ., Ithaca.)
ON CROSSING-OVER AND SEX IN THE FOWL. *Amer. Nat., 87:* 393-394.—Evidence is presented in support of the author's contention

that crossing-over in the fowl is apparently very little influenced by sex. In the case of crossing-over between creeper (*Cp*) and rose comb (*R*), the values determined by different investigators, and those determined in different years by the same investigator, are far too variable to permit much reliance to be placed on any statistical constants derived from lumped data. Further, the possibility of erroneous classification must be taken into account. In the 4 other pairs of linked genes for which large numbers are available, no consistent or significant effect of sex has been observed. (Animal Breeding Abstracts)

JEROME, F. N. 1954. (Ontario Agric. Coll., Guelph.)
COLOR INHERITANCE OF GEESE: STUDY 2. *Poult. Sci., 33:* 525-528.—The character, neck stripe, has been found to result from autosomal genes.

Limited data indicate that the pattern types, solid and spotted, result from the action of sex-linked genes.

It appears that the adult shades of the Pilgrim breed in which the ♂ is white and the ♀ grey (dilute), result from interaction of sex-linked dilution with the solid pattern of dark grey. The genotypes suggested for this breed are GG SpSp SdSd ♂ and G? Sp- Sd- ♀. It is postulated that one gene for sex-linked dilution reduces the dark grey of the ♀ to dilute grey and that the additive effect of 2 genes for sex-linked dilution reduces the dark grey of the ♂ to white.

A mating of Emden ♂×Pilgrim ♀♀ produced progeny in which both sexes were white as adults. The proposed genotypes of the cross-bred progeny are GG Spsp SdSd ♂ and G? sp- sd- ♀.

Limited data indicate grey to be the dominant allele of buff. Further investigation is necessary to determine whether the genes responsible are autosomal or sex-linked. The symbol (G) is proposed for grey. (Animal Breeding Abstracts)

JEROME, F. N. 1954.
THE BREEDING OF BROILER CHICKENS. *Agric. Inst. Rev. [Ottawa], 9(1):* 13.—The Columbian and White varieties of Plymouth Rocks were chosen at the Department of Poultry Husbandry as basic stock to develop good strains for the expanding broiler industry in Ontario. White or near-white plumage and yellow skin are among the desirable characters of broilers. The Columbian Rocks originated from yellow-skinned segregates of the Light Sussex breeds; the pattern (silver) is essentially white, and ♂♂ crossed with red varieties produce offspring of the Columbian colour. The White Rocks are homozygous for the recessive gene colourless or white; a strain homozygous for white was developed from individuals located by the colour test of White Rocks. Especially in the Columbian Rocks rapid growth appears to occur at the expense of egg production. In crosses between dual-purpose breeds growth rate resembled that of purebred broiler strains. (Animal Breeding Abstracts)

KIMBALL, E. 1954.
RED-BREASTED MUTATION IN *GALLUS GALLUS*. *Poult. Sci. 33:* 871-872.—A cockerel with considerable red flecking on the breast occurred among the progeny of a wild ♂ fowl of Cochin-Chinese origin. When mated to 3 ♀ sibs the cockerel produced 5 black-breasted and 6 red-flecked ♂ offspring. One of the latter yielded 5 ♂ offspring with black breasts and 4 with red-flecked breasts. With sibling ♀♀ the same ♂ sired 3 red-breasted sons, 2 ♂ offspring with red-flecked breasts, and 2 black-breasted ♂♂. The available data suggest that the mutant red-breast factor (*Rb*), which behaves as an autosomal semi-dominant, is a low-grade melanin restrictor; it is augmented by the general restrictor influence of *R* and overridden by oestrogenic melanisation in the ♀. (Animal Breeding Abstracts)

KUZNECOV, L. R. 1953. (Kiev. Vet. Inst.)
VEGETATIVNAJA GIBRIDIZACIJA PTIC. [VEGETATIVE HYBRIDIZATION OF BIRDS.] *Priroda [Mosk.], 42:* 117-118.—The experiments were carried out in 1951-52. After natural incubation for 26 hrs. 6 ml. albumen was withdrawn through a hole (0.6×0.6 mm.) in the

shell of a Leghorn egg 1.5 cm. from the round end, and replaced by 6 ml. albumen from a domestic duck egg; the hole was sealed up and incubation continued. The cockerel which hatched out had the head and neck of a normal cockerel but had a wide breast, narrow wings close to the body, a tail like that of a duck, and long skin-coloured legs, and all the rear part of the body was duck-like; the plumage was greenish, dark brown, grey and white.

A chick from a hen's egg to which 4 ml. of albumen from a hen's egg was added 9 hrs. after the start of incubation hatched out 48 hrs. early and weighed 1.17 g. more than the controls. A healthy duckling hatched out of a duck egg to which 3 ml. albumen from a hen's egg was transferred 9 hrs. after the beginning of incubation. The embryos died in 3 hen eggs to each of which 4 ml. albumen from duck eggs was transferred. (Animal Breeding Abstracts)

LUHMANN, M. 1954.
UBER DIE VERERBUNG DER FARBUNG BEI GANSEN. [ON THE INHERITANCE OF COLOUR IN GEESE.] *Arch. Geflügelk., 18:* 72-75.—The views expressed by F. N. Jerome on colour inheritance in geese, based on White Chinese (♂)×Emden (♀) crosses [*see A.B.A., 21,* No. 1458], are examined critically. Unlike Jerome, the author does not consider the production of coloured offspring by white parents "a unique result." He points out that this phenomenon is not unusual in cases of interspecific hybridization. In crosses between species the white parent will also transmit the plumage pattern characteristic of its species; the presence of the neck stripe would therefore be expected in hybrid offspring of a white Chinese goose. However, the expression of this character is intermediate between the narrow, sharply defined stripe of the Chinese goose and the broad, ill-defined stripe of the grey goose; the neck stripe cannot, therefore, be regarded as dominant in inheritance, as Jerome suggests. It is also not accurate to class the protuberance on the forehead as a dominant character, since in the hybrids it is intermediate in shape and size.

Observations by the author have also failed to confirm Jerome's claim that the white breast patch and solid pattern are dominant characters. Even when the plumage of the adult hybrids showed no sign of spotting, the dark olive-green webs of the goslings were invariably spotted. Jerome's use of gene symbols for the characters mentioned above does not seem to be justified at this stage in view of our inadequate knowledge regarding their inheritance. The down colour of Jerome's hybrid goslings (♂♂ light grey, ♀♀ dark grey), if spotting is disregarded, was similar to that obtained by Lühmann in crosses between a white Chinese gander and grey Chinese geese. The assumption of a dilution factor to explain the occurrence of dark grey and light grey hybrids does not appear to be necessary, although it looks as if this factor in some lines of Emden geese in the U.S.A. has led to the production of auto-sexing breeds .

The author does not consider the production of autosexing breeds of geese of first importance in Germany. It seems to him more important to select for and establish economic characters, such as good fattening ability. (Animal Breeding Abstracts)

McCARTNEY, M. G. 1954. (Pennsylvania Agric. Exp. Sta., State College.)
THE PHYSIOLOGY OF REPRODUCTION IN TURKEYS. 4. RELATION OF FREQUENCY OF MATING AND SEMEN DOSAGE TO REPRODUCTIVE PERFORMANCE. *Poult. Sci., 33:* 390-391.—White Holland turkey pullets were mated: (1) with 0.05 ml. of semen at intervals of 2 wks. and 3 wks., resp., and (2) with 0.025 ml. of semen at intervals of 2 wks. and 3 wks. resp.

During the 12-wk. period following the onset of mating, differences in fertility, hatchability and poult production among ♀♀ mated by A.I. at 2 mating intervals and with 2 dosages of semen were found to be non-significant.

On the basis of these data, it is suggested that for the most efficient use of semen and labor, turkey breeders should inseminate their flocks with 0.025 ml. of semen at intervals of 3 wks. (Animal Breeding Abstracts)

MALAYA: VETERINARY DEPARTMENT. 1954.

POULTRY BREEDING EXPERIMENT. *Rep. Vet. Dep. Malaya*, 1952: 15.—A breeding experiment was begun in 1948 with the object of producing a strain more productive in meat and eggs than the local Chinese Kampong and hardier than imported breeds. The F_1 progeny of Chinese Kampong hens and Buff Leghorn cocks were superior to selected indigenous birds in size (4 lb. v. 3 lb. 12 oz.), egg weight (1¾ v. 1½ oz.) and av. monthly egg production (13 v. 10). The performance was then compared of Buff Leghorn × Chinese Kampong F_2 birds and the backcross of the F_1 to their Buff Leghorn sires. The latter cross averaged 13 eggs/month v. 8 for the F_2. Egg weight was 1¾ v. 1⅝ oz. resp. and the backcross was less broody. Weights of F_1 and F_2 cockerels were 6 lb. 10 oz. and 6 lb. 9 oz. resp. v. 6 lb. 12 oz. for the backcross and 5 lb. 12 oz. for the Chinese Kampong. (Animal Breeding Abstracts)

MANNEL, K. 1954. (Inst. Kleintierz., Humboldt-Univ., Berlin.)

WEITERE ERGEBNISSE VON EIWEISSTRANSFUSIONSVERSUCHEN BEI HUHNEREIERN, II. MITTEILUNG. [FURTHER RESULTS OF ALBUMEN-TRANSFER EXPERIMENTS WITH HENS' EGGS. II.] *Tierzucht, 8:* 276-278.—The 2 White Leghorn chicks produced in 1951 from eggs in which the albumen was replaced by that from R.I.R. eggs (*see A.B.A., 21,* No. 1437) developed normally and exhibited only W.L. characters. In 1952 only one Sussex chick was reared out of 6 hatched from treated eggs; growth was normal and egg production was greater than that of the controls or that of her dam; 94% of the eggs were fertile. In 1953 chicks were hatched from 61 treated eggs; albumen from R.I.R. and Leghorn eggs was not assimilated as well in Sussex eggs as that from Leghorn and Sussex eggs in R.I.R. eggs. No differences in conformation and plumage were noted between chicks from treated eggs and their controls. In the winter Sussex pullets from eggs injected with R.I.R. and Leghorn albumen produced an average of 19.3 and 15.0 eggs resp. v. 17.2 for the controls; Leghorns from eggs injected with R.I.R. albumen produced 27.8 eggs v. 20.4 for their controls. (Animal Breeding Abstracts)

MARCHLEWSKI, J. H. 1953. (Jagiellonian Univ., Cracow.)

THE GOLDEN PHEASANT HEN *CHRYSOLOPHUS PICTUS* L. AND THE DOMESTIC COCK *GALLUS DOMESTICUS* L. HYBRIDS OBTAINED BY MEANS OF ARTIFICIAL INSEMINATION. Reprinted from *Bull. Int. Acad. Polon. Sci. Lett., Cl. Sci. Math. Nat., B (II),* 1951. 443-449.—A 3-yr.-old golden pheasant hen was inseminated on 5 occasions with semen from a White Leghorn cock, once with semen from a crossbred cock (possibly of R.I.R.×Golden Wyandotte ancestry), and 3 times with White Leghorn semen mixed with semen from the crossbred cock. Of 9 eggs laid after the 1st insemination with W.L. semen, the first 3 were infertile, 3 had embryos which died at an early stage and 3 hatched on the 20th-21st day of incubation. A deformed ♀ chick, which was yellow with brown markings, died a few moments after hatching. The two hybrids which survived (a ♂ and a ♀) had pure white down. They resembled golden pheasant chicks in conformation but were slightly larger. Their second plumage was also white, but the ♂ had a few minute light brown spots on the breast and upper tail coverts. They showed great vitality and were much less delicate than golden pheasant chicks. (Animal Breeding Abstracts)

MIDTLID, S. 1953. (Inst. Anim. Breed. Genet., Agric. Coll. Norway, Vollebekk). [English summary]

GENETISKE UNDERSOKELSER AV EGGYTELSEN HOS KVITE ITALIENERE. [GENETICAL RESEARCHES ON THE EGG YIELD OF WHITE LEGHORNS.] *Meld. Norg. LandbrHogsk., 33:* 425-476.—The number, av. weight and total weight of the eggs of White Leghorns were recorded over the 1st laying year. Birds hatched in Feb. and the first part of March gave the highest yield in number and weight of eggs. Egg size increased with age at 1st egg up to 215 days. The number of eggs increased with age at 1st egg up to 159 days, but decreased after 215 days. The total weight reached a maximum when the age at 1st egg was 159 days, and decreased after 229 days. The correlation

observed between hatching date and date of 1st egg was not significant. Egg size increased with weight of the hen at maturity up to 2300 g., but at higher weights did not increase further.

Analysis of variance and covariance was made for daughters, dams and granddams in respect of egg number, egg size, and total weight of eggs. It was concluded that egg number is to some extent determined by sex-linked genes. Egg size was less affected by environment than egg number. Sex-linkage was less important and dominance insignificant. Heritability was greatest for egg size and least for total weight of eggs. It was concluded that difference in hatching date between dams and daughters was not likely to introduce systematic errors in this analysis.

It was calculated that the significance of progeny tests increases only slightly when the number of daughters exceeds 15 for egg number, or 10 for egg size.—*J. C. D. Hutchinson.* (Animal Breeding Abstracts)

NEW ZEALAND: DEPARTMENT OF AGRICULTURE. 1953.

NEW ZEALAND UTILITY POULTRY STANDARDS OF PERFECTION AND BREEDING OF POULTRY. Compiled by the Utility Poultry Standards Revision Committee (1947-52). [*Auckland, Palmerston North, Hastings, Wellington, Christchurch and Dunedin*]: *Department of Agriculture, New Zealand.* 80 pp. Price: 5s.—Standards and illustrations are given of the following breeds of poultry: Ancona, Leghorn, Minorca, Australorp, Langshan, Orpington, Plymouth Rocks, R.I.R., Light Sussex, Wyandotte, and of Indian Runner, Khaki Campbell and Pekin ducks. The publication includes information on preparation of birds for show, on serious defects and disqualifications, the N.Z. Poultry Flock Improvement Plan, laying trials, standards for judging eggs and table poultry, and the broad principles of breeding. A glossary of terms is also given. (Animal Breeding Abstracts)

NORDSKOG, A. W., and GHOSTLEY, F. J. 1954. (Iowa Agric. Exp. Sta., Ames. [Author's summary]

HETEROSIS IN POULTRY. 1. STRAIN CROSSING AND CROSSBREEDING COMPARED WITH CLOSED FLOCK BREEDING. *Poult. Sci., 33:* 704-715.—Eight strains representing 4 breeds (New Hampshires, Rhode Island Reds, Barred Plymouth Rocks, and Australorps) were mated in all combinations in each of 3 yrs. From each mating pen, offspring were obtained which represented 3 mating systems—pure strains, strain crosses, and breed crosses. A total of 8263 chicks were hatched of which 2107 pullets were housed during the 3-yr. period.

Growth to 8 wks. of age appeared to be the most consistent expression of hybrid vigor. The strain crosses and crossbred pullets averaged 4% and 7% heavier than the pure strains at this age. A significant interaction between mating system and breed was observed. The fastest growing crosses in each year were strain cross N.H.s. The fastest growing crossbreds also involved the N.H. breed.

In hatch of total eggs set the crossbreds were best and the pure strains were slightly better than the strain crosses.

Percent. brooder, range, and laying house mortality was 10, 18, and 31 for the crossbreds; 11, 19, and 20 for the strain crosses; and 15, 22, and 33 for the pure strains, resp. The results for the 3 mating systems were less consistent over the 3 yrs. for adult mortality than for brooder mortality. It appears that heterosis for livability occurs early in the life of the chick, but tends to disappear as the chick approaches maturity.

In total eggs produced the 3 yrs.' results favor strain crosses and crossbreds by 10% and 12%, resp., over pure strains.

Adult body weight of strain crosses and crossbreds was about 5% greater than pure strains. Egg weight did not appear to be influenced by the mating system.

On the basis of over-all performance the strain crosses were intermediate to the crossbreds and pure strains. (Animal Breeding Abstracts)

NORTHERN IRELAND: MINISTRY OF AGRICULTURE. 1953.

REPORT ON EGG-LAYING TEST, PROGENY TESTING AND COCKEREL TESTING, 1952-53. *Stormont, Belfast: Ministry of Agriculture, Northern Ireland.* 46 pp.—The 31st egg-laying test at Stor-

mont started 1st Oct. 1952 and ended 1st Sep. 1953 (see No. 1743). The 900 pullets accepted for testing averaged 184.9 eggs; White Wyandottes and Buff Rocks, White Leghorns, Black Leghorns, R.I.R.s, and Light Sussex accounted for the majority, although Brown Leghorns, Anconas and Welsummers were represented. There were 22 progeny testing entries, each consisting of 12 daughters, of 1 sire from at least 6 dams of which the egg records are known, and also 4 proven sire entries, each of 6 sisters or half sisters selected by the breeder. Details of each test are tabulated according to breed and breeder in respect of awards, number of eggs laid, and mortality. Twenty-eight cockerels, sons of an officially recorded hen and of a sire of which the dam's record was known, were tested by leaving each cockerel in a breeding pen of his breed until 100 eggs suitable for hatching were obtained; the production of a random sample of 12 daughters of each sire was subsequently recorded. Data are tabulated. (Animal Breeding Abstracts)

NORTHERN IRELAND: MONTHLY AGRICULTURAL REPORT. MINISTRY OF AGRICULTURE. 1953.

COCKEREL TESTING RESULTS. *Mon. Agric. Rep. Minist. Agric. N. Ire., 28:* 170-171.—Out of 28 cockerels tested in 1952/53, 4 White Leghorns, 6 R.I.R.'s and 2 Light Sussex qualified as proven sires. The best performance was by a pen of R.I.R. pullets which averaged 239.5 eggs of which 210.16 were scoring eggs. Mortality in the 12 qualifying pens was 3.47% v. 11.6% for all pens entered. (Animal Breeding Abstracts)

NORTHERN IRELAND: MONTHLY AGRICULTURAL REPORT. MINISTRY OF AGRICULTURE. 1953.

EGG LAYING TEST RESULTS. *Mon. Agric. Rep. Minist. Agric. N. Ire., 28:* 165-170.—Results are given of the 1952/53 egg laying test at Stormont. Of the principal breeds entered, Light Sussex had the best performance with a hen-housed average (24 pens) of 198.88 eggs in 48 wks. Other breeds were as follows: White Leghorn 189.56, R.I.R. 184-58, Black Leghorn 179.49, White Wyandotte 153.69.

There were 22 progeny testing entries, each consisting of 12 daughters of one cockerel. Twelve cockerels qualified by having a minimum of 180 scoring eggs per daughter. Of these, 7 were W.L., 2 Black Leghorn, 2 R.I.R. and 1 Light Sussex. (Animal Breeding Extracts)

NORTHERN IRELAND: MONTHLY AGRICULTURAL REPORT. MINISTRY OF AGRICULTURE. 1954.

TYPE AND EGG PRODUCTION. *Mon. Agric. Rep. Minist. Agric. N. Ire., 28:* 291-292.—Data taken from the latest laying test at Stormont N. Ireland (*see* No. 1743), are presented in order to see if any relationship exists between egg production and type as judged by the marks awarded at the end of the test.

Four breeds were represented: R.I.R., Light Sussex, White Leghorn, and Black Leghorn, and pens were divided into 2 groups, those which received a 1st class certificate for egg production and those which did not. With the exception of the W.L. pens, the good layers obtained a slightly higher av. percentage of total marks for type; thus in the case of the R.I.R. 21 certificate pens averaged 196.9 eggs and 69.3% marks, whereas 25 other pens averaged only 159.6 eggs and 66.4% marks. In the case of the W.L. the poor layers (av. 160.3 eggs) averaged 74% marks v. 73.2% for the good layers (av. 200.2 eggs).

In a similar comparison between birds entered for progeny testing and those in ordinary pens, the former, except in the case of L.S., gained a higher av. mark for type than the latter. (Animal Breeding Abstracts)

OLSSON, N. 1953.

KORSNINGS- OCH UPP-FODNINGSFORSOK MED GASS. [EXPERIMENTS IN CROSSBREEDING AND REARING GEESE.] *Medd. Husdjursforsok LantbrHogsk. LantbrForsok, No. 53:* 24 pp.—Egg production, growth and slaughter performance were studied in the same geese as those used for an investigation of the inheritance of feather color (see preceding abstract), a brief account of which is included in this paper. Av. numbers of eggs laid by 79 ♀♀ during the breeding sea-

son are given for the purebreds and for the various crossbred matings, the lowest being Scanian×Scanian with 20.8, and the highest (Scanian ×Roman) ♂×(Toulouse×Roman) ♀ with 51.0. Percentage fertile eggs varied from 33.3 to 89.4 in the matings between purebreds and from 79.7 to 88.4 in the matings involving crossbreds, while hatching percentages (in artificial brooders) varied from 9.9 to 61.4 in the former and from 35.0 to 58.8 in the latter. Av. egg weight varied from 170.3 g. to 206.3 g. according to mating group and was greater by 1.2-10.7 g. for eggs that hatched than for eggs that did not hatch. There was a straight-line regression of live weight after hatching on egg weight.

Live weights and growth weights of the different breeds and crossbreds are compared in tables and graphs. Live weight at 120 days was 7.48, 6.24 and 5.77 kg. in ♂ Scanian, Toulouse and Roman geese resp. and 6.40, 5.13 and 4.47 kg. in the ♀♀ of corresponding breed. The live weights of the crossbreds were on the whole slightly greater than the parent breeds' intermediate weight. Crossbreeding had a particularly favorable effect on growth rate in the case of Toulouse ♂×Roman ♀. In general, growth was most rapid between the 2nd and 9th wks. after hatching.

Slaughter and dressing caused a loss in weight averaging 11.9% of live weight before slaughter; the loss was least (10.3%) in Scanian geese. In all geese the regression of feather weight on live weight before slaughter was shown to be straight-line. (Animal Breeding Abstracts)

PLUMART, P. E., and MUELLER, C. D. 1954. (Univ. Minnesota, St. Paul, and Kansas Agric. Exp. Sta., Manhattan.) [Author's summary]

EFFECT OF SEX-LINKED EARLY FEATHERING ON PLUMAGE FROM 6 TO 12 WEEKS OF AGE. *Poult. Sci., 33:* 715-721.—Feathering of broilers was studied by classifying individual feathers according to degree of maturity. Counts were made of 38,810 feathers from 142 chicks. Pullets with the sex-linked gene for early feathering possessed considerably better back feathering than did late feathering pullets at 6, 8, and 10 wks. of age, but pullets of the 2 types showed little difference at 12 wks. Early feathering cockerels had greater maturity of back feathers than did late feathering ones at all 4 ages.

Among 237 chicks dressed at 12 wks. of age, the early feathering chicks had a better dressed appearance than did the late feathering ones. A significantly higher body weight was noted only in the ♀♀ of the early feathering type at 12 wks.

Visual classification of feathering in live chicks at 6 wks. of age provided an excellent indication of the degree of maturity of plumage up to the age of 12 wks. (Animal Breeding Abstracts)

PUN, C. F. 1954. (Univ. California, Davis.)

THE CROOKED NECK DWARF LETHAL SYNDROME IN THE DOMESTIC FOWL. *J. Exp. Zool., 126:* 101-133. (B.)—Matings were carried out between birds of the New Hampshire breed heterozygous for the autosomal, recessive, crooked-neck dwarf lethal gene, and a comparative study was made of the normal and defective offspring. Embryos homozygous for the lethal gene were characterised by their crooked neck, crooked spinal column, slightly shorter upper beak, spindly legs, curly toes, and reduced sternum without keel and lateral processes. All parts of the skeleton, musculature and internal organs were reduced in size. Oedema was present, and the stomach was empty of food. Lethal embryos showed little growth after the 13th-16th day and usually died in the 20th or 21st day of incubation. They never hatched.

It is possible to distinguish lethal from normal embryos as early as the 10th day of incubation by their curly toes. Earlier than that, no morphological differences are evident. The author suggests that the greatly retarded growth and eventual death of the homozygotes are a result of chronic starvation due to the inability to swallow the amniotic fluid. (Animal Breeding Abstracts)

SHAKLEE, W. E., and KNOX, C. W. 1954. (Anim. Poult. Husb. Res. Branch, U.S. Dep. Agric., Beltsville, Md.)

HYBRIDIZATION OF THE PHEASANT AND FOWL. *J. Hered., 45:* 183-190.—Dark Cornish and Silver Cornish hens were mated either

naturally or by artificial insemination with Mongolian × Ringneck pheasant ♂♂. Of 1409 eggs examined, 3.48% showed development when incubated. It is thought, however, that in some cases the development was parthenogenetic and not a result of fertilization of the egg with pheasant sperm. Of 12 hens that produced activated eggs, 2 accounted for 63% of the total number.

On the 25th day of incubation 5 hybrid chicks (4 ♂♂ and 1 ♀) pipped, but only 2 ♂♂ and 1 ♀ were able to hatch. These were easily reared to physical maturity, but they were never observed to mate. When killed at 462 days of age the ♀ had not laid any eggs. The amount of ovarian tissue present was found to be very small. The testes of the ♂ hybrids weighed only 0.25 g. v. 26.2 g. for Silver Cornish ♂♂ of the same age. No spermatozoa were found.

A detailed description of the hybrids is given. In behavior and general appearance they resembled the pheasant more than the domestic fowl. In body weight they were intermediate between the parental species. (Animal Breeding Abstracts)

SKALLER, F. (Poultry Res. Centre, Werribee, Victoria.)
STUDIES ON THE ASSESSMENT OF EGG PRODUCTION IN POULTRY BREEDING INVESTIGATIONS. 1. THE OPTIMAL PERIOD FOR RECORDING FIRST YEAR EGG PRODUCTION. 2. THE CORRECTION OF HATCHING DATE FOR EARLY SELECTION BASED ON PART-ANNUAL EGG PRODUCTION RECORDS. *Poultry Sci., 1954, 33:* 29-35, 316-321.—1. The data come from a statistical examination of the first year laying records of a sample, stratified for hatching date, of 200 birds from a flock of 1375 White Leghorn pullets. Critical examination of the existing methods for measuring the number of eggs laid in the first year, namely, by biological pullet year, by biological calendar year and by the 500-day test, showed all to be significantly influenced by hatching date. A new interval, known as the standard pullet year, is substituted and is shown to be uninfluenced by date of hatching. The number of eggs laid by the bird is measured from the first one to 31 March in the following year (southern hemisphere seasons). It is suggested that a combination of the standard laying year and the 500-day test could be used to facilitate the investigation of problems of management.

2. The data presented in this paper come from a statistical examination of the records of a sample of 200 birds from a larger flock. (All dates and seasons apply to the southern hemisphere.) In order that the records of one year's laying could be used to select birds for breeding in the second year, it was found that records must be terminated at 31 May, since mating takes place soon afterwards for hatching in early July. As the hatching season is spread over several weeks, 9 weeks for this particular flock, the production of different birds would be recorded for different times. The need for correction for this when annual part records are used is clear. The corrected egg number is given by the formula $E_{ab}\ (P_{ab} - N_{ab})/P_{ab}$, where E_{ab} is the number of eggs from first egg to 31 May for the ath bird in the bth hatch, P_{ab} is the number of calendar days from first egg to 31 May and N is the mean deviation of net potential laying days from those of the median hatch. An example is shown in the text. The correlation coefficient between part-winter records and egg numbers per standard pullet year was improved from 0.308 to 0.494 by correcting the part-winter number of eggs as described.—*M. J. Head.* (Nutrition Abstracts and Reviews)

SKALLER, F. 1954.
CROSSBREEDING IN POULTRY. *World's Poult. Sci. J., 10:* 58-59.—Further data are given relating to experiments comparing breeding systems being carried out at the Poultry Research Centre, Werribee, Australia (*see A.B.A., 22,* No. 308), based on a C.S.I.R.O. progress report (Sep. 1953).

Production records are available for 5 generations covering, in addition to purebreds, the following crossbreds: (1) single crosses between White Leghorns and Australorps; (2) 3-way crosses obtained by mating R.I.R. ♂♂ to crossbred ♀♀ from W.L. and Australorp parents; (3) crisscrosses, obtained by mating W.L. or Australorp ♂♂, alternat-

ing the breed each year, to crossbred hens from earlier matings between these breeds.

During each of the 5 yrs. 1948-52, crossbred pullets averaged approx. 18 more eggs per bird than the best purebred flocks from which their parents had been chosen without special selection.

The av. annual production from flocks of unculled crossbreds over the 5-yr. period was 216 eggs from single cross pullets, 210 from 3-way pullets and 214 from crisscross pullets. (Animal Breeding Abstracts)

SMYTH, J. R. (Jr.). 1954. (Massachusetts Agric. Exp. Sta., Amherst.) [Author's summary modified.]

HAIRY, A GENE CAUSING ABNORMAL PLUMAGE IN THE TURKEY. *J. Hered., 45:* 196-200.—A description is given of an autosomal recessive mutation in the turkey resulting in abnormal down and plumage. Normal feather webbing is absent in the adult mutant. Instead, the feathers appear to have short thick hairs attached to the rachis. Since the down plumules are also extremely modified and give the appearance of coarse hair, the name "hairy" is suggested for this condition. The "hairy" gene appears to have no deleterious effects on embryonic development and hatchability, but under commercial growing conditions "hairy" turkeys have shown a reduced viability. (Animal Breeding Abstracts)

VAN DER EYNDEN, M. 1954.

OVER HY-LINE HYBRIDE-KIPPEN. II. NEDERLANDSE, BELGISCHE EN FRANSE PRODUCTIECIJFERS. [ON HY-LINE HYBRID FOWLS. II. DUTCH, BELGIAN AND FRENCH PRODUCTION FIGURES.] *Weekbl. nieuwe Velvode, 20:* 445-446.—Figures are given which illustrate the superior performance of Hy-Line fowls in respect of egg yield, egg weight and food utilization efficiency. Birds hatched from American Hy-Line eggs on 18th March 1952 produced, under European conditions, an average of 245 eggs per hen between Aug. 1952 and July 1953 (inclusive) compared with 169 eggs per hen for R.I.R.s and 175 for White Leghorns. Food consumption per egg laid was 192 g. for Hy-Lines, 238 g. for R.I.R.s and 247 g. for W.L.s Av. egg size was greater in the Hy-Lines than in the other 2 breeds. In the 18th Belgian National Laying Trials held at Roeselaere in 1952-53 the av. egg yield per hen over a 336-day period was 243.0 for Hy-Lines v. 219.4 for R.I.R.s, 205.4 for New Hampshires, 186.6 for Sussex and 179 for W.L.s. Corresponding averages for egg weight were 61.1 g. v. 58.8 g., 58.4 g., 58.7 g., and 58.1 g. Laying trials in France have given similar results. The uniformity of Hy-Line birds as regards egg production ensures that the farmer will receive birds which are not inferior in perfomance to those used in the laying trials. It is expected that about half a million Hy-Line chicks will be made available to Belgian farmers in the 1953-54 hatching season. (Animal Breeding Abstracts)

PHYSIOLOGY

BALDISSERA NORDIO, C. 1953. (Ist. Zootec. Gen., Univ. Milan.) [French and English summaries.]

SULLA CRESTOTOMIO DELLE GALLINE OVAIOLE.]DUBBING LAYING HENS.] *Atti Soc. Ital. Sci. Vet., 1952, 6* (Suppl. to *Arch. Vet. Ital., 4,* No. 3): 114-116.—In addition to information already abstracted this paper describes the discovery of small quantities of oestrogen in the combs of twenty-five 10-mth-old laying White Leghorns. (Animal Breeding Abstracts)

BAROTT, H. G., and PRINGLE, E. M. 1951. (Bur. Anim. Indus., U.S. Dep. Agric., Beltsville, Md.)

EFFECT OF ENVIRONMENT ON GROWTH AND FEED AND WATER CONSUMPTION OF CHICKS. IV. THE EFFECT OF LIGHT ON EARLY GROWTH. *J. Nutr. 45:* 265-274.—Groups, each of 30 R.I.R. chicks, were subjected to varying regimes of light and dark. Growth was best when 1 hr. light alternated with 3-4 hrs. of darkness; total feeding

time had no consistent effect on growth. Light for 24 hrs. produced better growth than 10-14 hrs. Light only great enough for the chicks to see their food was as efficient as greater intensities. Growth was stimulated only slightly by ultraviolet radiation. There was no appreciable difference in the growth of chicks in houses lit by white, red, blue or green lamps when the walls were white, but when the walls were the same colour as the lamps, mortality was high, as the chicks failed to eat.—(Animal Breeding Abstracts)

BAUER, H., ZIMMERMAN, P., and VOSS, A. E. 1953. (Tierhyg. Inst., Univ. Freiburg; ditto; and C. F. Boehringer u. Söhne, Mannheim.) [English summary.]

DAS CHEMISCHE KAPAUNISIEREN VON HÄHNCHEN. [CHEMICAL CASTRATION OF COCKERELS.] *Arch. Geflügelk., 17:* 37-53. —The literature is reviewed. A series of 10 experiments on 861 cockerels was carried out using German, French, Swiss and American oestrogenic preparations, to study dosage levels and duration of action, the optimum age of castration and length of fattening period, weight gains made by hormonal and surgical castrates and uncastrated ♂♂, and meat quality. (Animal Breeding Abstracts)

BENOIT, J., and I. ASSENMACHER.

RAPPORT ENTRE LA STIMULATION SEXUELLE PREHYPOPHYSAIRE ET LA NEUROSECRETION CHEZ L'OISEAU. *Arch. Anat. Microsc. et Morphol. Exptl. 42:* 334-386. Illus. 1953.—The paper includes a detailed description of the normal duck hypophysis together with its complex vascularization. The pars nervosa receives blood from the internal carotid artery but the pars distalis blood supply is almost exclusively by a portal system from the median eminence of the neurohypophysis toward the hilar region of the distals. In this median eminence are very numerous arched nerve endings from the hypothalmohypophyseal tract which produce abundant Gömöri-positive neurosecretion granules. Three types of lesions were produced in the exptl. animals; eminentiotomy, or destruction of the nerve tracts into the eminence; tractotomy, or cutting the portal blood supply to the distalis; and mischotomy, or cutting the infundibular stalk to the nervosa. The details of operation through the orbit are described. The testes were examined before the operation in the spring, and some animals were killed soon after, some a month later before the seasonal regression of the testes, some lived through the summer and were artificially illuminated for a month to stimulate the testes before killing. There was no effect from mischotomy on the testes, which remained responsive to light stimulation. The result of eminentiotomy and mischotomy was a degeneration of nerves in the pars nervosa. In addition eminentiotomy caused a degeneration of the secreting area in the eminence. Eminentiotomy and tractotomy both caused great reduction in the testes which were no longer sensitive to light stimulation. The thyroids and the adrenals remained normal and there was some hypertrophy of the pars distalis. The conclusion is suggested that the gonadotropic hormone of the anterior hypophysis is controlled by hypothalamic neurosecretion which itself may be controlled by light, while thyrotropic and adrenotropic hormones are under the control of "systemic factors" without participation of the hypothalamus. —*Hope Hibbard.* (Biological Abstracts)

BOGDONOFF, P. D. Jr., and C. S. SHAFFNER. (U. Maryland, College Park, Md.)

THE EFFECT OF pH ON IN VITRO SURVIVAL, METABOLIC ACTIVITY, AND FERTILIZING CAPACITY OF CHICKEN SEMEN. *Poultry Sci. 33:* 665-669. 1954.—Semen samples collected from New Hampshire yearling males and the pH of freshly collected samples was found to range between pH 6.72 and 6.94. This semen was used to study the effect of pH on methylene blue reduction time of semen combined with various physiological diluents. An alkaline pH increased the activity of the spermatozoa, while acid pH's had the opposite effect. It was further shown that several physiological salines in isotonic solutions could be effectively used in diluents for fowl semen. Diluted semen was stored at reduced temp. (7 to 9°C) in media adjusted to pH's 6.0, 7.0

and 8.0 and examined for persistence of motility at two-day intervals. Motility was best preserved at pH 6.0 where sperm activity is reduced. To study the effect of pH on fertilizing ability, semen was diluted 1-5 in media of pH's 6.0, 7.0 and 8.0 and artificially inseminated. The results indicate that pH is significant only when semen is diluted and that the alkaline condition is more harmful than the slightly acid condition.—*Authors.* (Biological Abstracts)

CAMPOS, AMADO C. and F. M. FRONDA. (University of the Philippines, College of Agriculture, College, Laguna, Philippines).
THE EFFECT OF SYNTHETIC ESTROGEN IMPLANTATION ON GAIN IN WEIGHT AND SUBSEQUENT REPRODUCTIVE ABILITY OF YOUNG S.C. WHITE LEGHORN COCKERELS. *Philippine Agric. 37:* 473-478. 1953.—Pellet implantation induced better gain in body weight, decreased mortality, effected temporary suppression of male aggressiveness and pugnacity, but permitted the majority of the treated males to recover and exhibit a normal mating behavior and a normal level of fertility.—*F. M. Fronda*

COLIGADO, ELPIDIO, C. (University of the Philippines, College of Agriculture, College, Laguna, Philippines).
THE RELATION OF LENGTH OF INCUBATION PERIOD TO GROWTH, MORTALITY, AND SEX RATIO IN SINGLE COMB WHITE LEGHORN CHICKS. *Philippine Agric. 37:* 111-118. 1953.—When the chicks were 12 weeks old, those that emerged early were heavier than either the middle or late emerging which weighed about the same and they had the lowest percentage of mortality. Female chicks predominated during the first eight hours of hatch, equal numbers of males and females during the next eight hours, and slightly more males, than females during the last eight hours of hatching.—*F. M. Fronda*

CROSS, J. C. 1953. (Texas Technol. Coll.)
OXYGEN TENSION AS A FACTOR IN MEIOSIS. PRELIMINARY EXPLORATORY WORK. *Cytologia [Tokyo], 18:* 293-296.—Observations on testicular material have confirmed that in the domestic cock meiosis normally occurs at night. Very few dividing cells were observed in material collected during the daytime. Meiosis was induced in 3 birds close to high noon by subjecting them to an environment of pure oxygen for 1 hr. In the experimental material meiosis was at a higher rate than that occurring in normal testicular material at night. The evidence suggests that meiosis in the ♂ fowl is dependent on the supply of oxygen reaching the testes. (Animal Breeding Abstracts)

DEMKE, DONALD D.
A BRIEF HISTOLOGY OF THE INTESTINE OF THE TURKEY POULT. *Amer. Jour. Vet. Res. 15:* 447-449.1954.—While the normal histology of the intestines of poults is essentially similar to that of chickens, several differences were noted. Histological sections of the duodenum (239), upper intestine (127), lower intestine (172), ceca (472), and rectum (331) were made from 16 poults aged 1 day to 12 wks. No marked distinction could be seen between the parts except for the duodenum, ceca, and rectum. Villi decreased in height from duodenum to rectum. No villi were found in those parts of the ceca examined. Lymphoid tissue was present in the tunica propria of all ages of poults. Argentaffin cells were present in the epithelium and tunica propria of all poults. The submucosa was poorly developed. The lamina muscularis was well developed throughout. Goblet cells were present throughout the epithelium. All lining epithelium had a cuticular border.—*D. D. Demke.* Biological Abstracts)

FRAPS, R. M. 1954. (Agric. Res. Serv., U.S. Dep. Agric., Beltsville, Md.)
NEURAL BASIS OF DIURNAL PERIODICITY IN RELEASE OF OVULATION-INDUCING HORMONE IN FOWL. *Proc. Nat. Acad. Sci. [Wash.], 40:* 348-356.—Oestradiol benzoate injected intramuscularly into regularly ovulating hens at levels of 1.0-2,5 mg. per hen suppressed 14% of expected first (C_1) ovulations of the cycle, in contrast with 55% of expected second (C_2) ovulations in similar cycles. 67% of suppressed

C_1 ovulations and 82% of suppressed C_2 ovulations occurred within the hours of normally occurring ovulation on the day following suppression. The incidence of suppressed ovulations (C_1 or C_2) and the proportion of ovulations delayed by 1 day were independent, over wide ranges, of the time from injection to normally expected ovulation. These observations constitute strong evidence that the neural mechanism believed to control the release of ovulation-inducing hormone from the anterior pituitary body exhibits diurnal periodicity in its thresholds of response to excitation hormones. This concept is shown to provide a basis for explanation of many of the characteristics of timing of the hen's ovulation cycle, as well as of effects following the administration of oestradiol benzoate. (Animal Breeding Abstracts)

FROUD, M. D. 1954. (Wye Coll., Univ. London.)
PERSISTENCE OF THE LEFT SYSTEMIC AORTIC ARCH IN THE CHICK. *J. Genet., 52:* 456-465.—In birds, the aorta is formed from the right-hand member of the 4th pair of embryonic aortic arches, the left one normally disappearing at an early stage in development. However, the left systemic was found to have persisted in a small percentage of late 3rd-week embryos (8.79%) and newly-hatched chicks (7.68%) of the R.I.R. breed. Signs of the left systemic were more frequent in ♀ (10.15%) than in ♂ embryos (7.35%). The fact that differences exist in the incidence of the anomaly in the offspring of individual cocks and hens suggests that it may be genetically controlled. There were significant differences between hatches but not between years. Persistence of the left systemic was more common in day-old ♂ chicks of the Light Sussex breed 23.21%) than in day-old ♂ chicks of the R.I.R. breed (6.77%). (Animal Breeding Abstracts)

GABUTEN, A. R., and SHAFFNER, C. S. 1954. (Maryland Agric. Exp. Sta., College Park.)
A STUDY OF THE PHYSIOLOGICAL MECHANISMS AFFECTING SPECIFIC GRAVITY OF CHICKEN EGGS. *Poult. Sci., 33:* 47-53.—The specific gravity of eggs, which normally declines as the production year advances, was increased or maintained by administration of penicillin, thyroprotein and stilboestrol; it was reduced by thiouracil, testosterone, cortisone and progesterone.

Egg production was unaffected by stilboestrol, cortisone and penicillin treatment; it was decreased by thiouracil, thyroprotein, testosterone and progesterone.

Penicillin feeding increased blood calcium levels and shell-breaking strength. (Animal Breeding Abstracts)

GRATTAROLA, M. M. 1954. (Ist. Zootec. Casear. Piemonte, Turin.)
[English summary.]
ORMONI NATURALI E SINTETICI NELL'ACCAPPONAGGIO. [THE USE OF NATURAL AND SYNTHETIC HORMONES IN CAPONIZATION.] *Ann. Sper. Agr. N.S., 8:* 33-49.—In preliminary experiments involving 25 birds of various breeds the physiological effects of 4 synthetic oestrogens and of stilbene were compared. Further experiments will be undertaken with a view to confirming the tentative conclusion that, from all points of view including the economic one, the use of stilbene implants of 25 mg. is to be preferred. (Animal Breeding Abstracts)

GREENWOOD, A. W. 1954. (Poult. Res. Centre, Edinburgh.)
IMPROVING ON NATURE. *Fmr's Wkly,* North. Ed. *40 (4):* 70-71.—Twenty day-old Brown Leghorn chicks (19 ♀♀ and 1 ♂) were placed in a climatic chamber (t° = 65°F., relative humidity 60%, 12 hrs. artificial light daily) on 19th March 1952 and have since been kept continually in this constant environment. As controls, 19 birds (18 ♀♀ and 1 ♂) of the same hatch have been intensively housed and winter-lighted to give an approximately 12-hr. light day. Fourteen pullets in one group each had a full sister in the other; the 2 ♂♂ were full brothers and bore either full or half brother relationship to the pullets. The data reported refer to these closely related birds.

Both groups of pullets began to come into lay in Aug. 1952. Early in the winter of that year all the control birds either moulted and ceased laying or were still sexually immature, whereas there were no late-maturing birds in the climatic room and throughout the winter only 1 of them broke production (for 14 days). The av. age at sexual maturity of the experimental ♀♀ was 168 days v. 196 for the controls.

By the 3rd week of Dec. 1953 birds in the control group were out of production while those in the constant environment were still laying, although 2 had previously moulted and been out of production for 33 and 26 days resp.

During a 50-wk. test from 1st Sep. to 16th Aug. the av. hen-housed production of pullets in the climatic room was 235 eggs per bird (highest individual record = 267 eggs) v. 175 eggs (highest individual record = 214 eggs) for the controls.

Of 3847 eggs incubated from the birds in the climatic room, 52 were infertile v. 35 out of 2694 control eggs set. Hatchability of all eggs set was 82% and 85% in the 2 groups resp. (Animal Breeding Abstracts)

HUTCHINSON, J. C. D. 1954. (Poult. Res. Centre, Edinburgh.) [Author's summary.]

A SIMPLE CLIMATIC CHAMBER FOR PHYSIOLOGICAL WORK WITH POULTRY. *J. Agric. Sci., 44:* 361-368.—The construction and performance are described of a simple climatic chamber for work on poultry in hot climates. In addition, brief reference is made to an improved ventilation system and to refrigeration equipment fitted to chambers of later design.

Air temperature and humidity may be controlled over a fairly wide range above that of the external air. Radiant temperature is maintained close to air temperature. The air movement averages about 20 ft./min. in the working space. The apparatus is suitable for accurate tests of heat tolerance lasting for a few hours, or for long-term experiments.

It is suggested that the provision of climatic chambers for use with farm animals in under-developed agricultural areas is not a formidable problem. (Animal Breeding Abstracts)

JOHNSON, A. S. 1954. (Centr. Exp. Farm, Ottawa.)

ARTIFICIAL INSEMINATION AND THE DURATION OF FERTILITY OF GEESE. *Poult. Sci., 33:* 638-640.—A successful technique for obtaining semen from ganders and for inseminating ♀ geese has been developed. Semen production of the ganders used varied considerably. The mean duration of fertility in a limited number of ♀♀ on trial was found to be 9.7 days. (Animal Breeding Abstracts)

DUBLIN: JOURNAL OF THE DEPARTMENT OF AGRICULTURE. 1952-53.

REPORT ON NATIONAL EGG-LAYING TEST, 1951-1952. *J. Dep. Agric.* [*Dublin*], *49:* 1-49.—A total of 102 pens each of 6 pullets was entered for the 40th test covering the 46 wks. from 1st Oct. 1951 to 17th Aug. 1952. Av. egg production for all birds entered was 180. Av. production per bird completing the full period was 194.7. Mortality was 10.9%.

Of the 5 breeds represented White Wyandotte averaged 204.8 eggs, R.I.R. 197.9, White Leghorn 179.8, Brown Leghorn 159.6, Light Sussex 194.7, Australorp 181.3 (4 birds only). 39.5% of the birds completing the test laid 200 or more special and 1st grade eggs. Details are given of the 201 birds awarded copper rings. (Animal Breeding Abstracts)

JULL, M. A. 1953. (Univ. Maryland, Baltimore.)

EGG QUALITY DECLINES AS LAYERS INCREASE IN AGE. *World's Poult. Sci. J., 9:* 273-274.—Observations reported by R. H. Adolph in *Nulaid News*, March 1953, are summarized. Eggs were obtained from 6 South Californian egg producing plants at each of which the laying pullets were housed according to age. A total of 29 cases of eggs was graded. The percentage of grade AA eggs for layers aged 12, 12-15, 15-18, 18-21, 21-24 mths. was 87.5, 72.3, 61.9, 43.6 and 20.3 resp. (Animal Breeding Abstracts)

KARAPETJAN, S. K. 1954. (Inst. Anim. Breed., Minist. Agric., Armenian S.S.R.)

VLIJANIE UDLINENNOI SVETOVOI EKSPOZICII NA PRODLENIE BIOLOGICESKOI I PRODUKTIVNOI ZIZNI DOMASNIH PTIC. [THE EFFECT OF EXPOSURE TO LENGTHENED LIGHT ON PROLONGING THE BIOLOGICAL AND PRODUCTIVE LIFE OF POULTRY.] *Dokl. Akad. Nauk SSSR, 94:* 585-588.—In 1947-48 at the Arabkir Experimental Base 15 indigenous hens and 15 Leghorns came into production under natural conditions of light. In 1949 and in the 3 subsequent years 7 of each group were exposed to 16 hrs. light daily. The experimental hens lived longer, some continuing in production in their 7th year, and their egg production was appreciably greater. Egg production of both groups is shown graphically and diagrammatically. Results are attributed to the effect of light on the central nervous system. (Animal Breeding Abstracts)

KAUFMAN, L., SWIAT-GANCARCZYKOWA, B., and BLONSKA, J. 1954. (Dep. Exp. Biol., Zootech. Inst., Pulawy.) [Russian and English summaries; English summary modified.]

POROWNANIE ZDOLNOSCI WYKORZYSTANIA PASZY NA PRODUKSJE JAJ U ZIELONONOZEK I SUSSEKSOW. [A COMPARISON OF FOOD UTILIZATION CAPACITY IN RELATION TO EGG PRODUCTION IN GREENLEG AND SUSSEX PULLETS.] *Roczn. Nauk Rol., B, 67:* 243-256.—The efficiency of food utilization in relation to egg production, calculated by the formula food consumption (g.) over egg output (g.), was compared in Greenleg and Sussex pullets. In birds of the same breed there was a positive correlation between food utilization efficiency and rate of egg production. In general, the efficiency of food utilization was greater in Greenleg than in Sussex pullets. During moult, the quantity of food consumed in relation to body weight was the same in both breeds. (Animal Breeding Abstracts)

KAUFMAN, L., W. DABROWSKA, W. GLUCHOWSKI, H. KRZANOWSKA, K. LEZIAK, and J. ZIEBA. 1953. (Dep. Exp. Biol., Zootech. Inst. Pulawy.)

I. BADANIA NAD DZIALANIEM PROMIENI POZAFIOLKOWYCH NA ZYWOTNOSC DROBIU. II. NASWIETLANIE JAJ PRZED INKUBACJA. [I. INVESTIGATIONS ON THE EFFECT OF ULTRA-VIOLET RAYS ON THE VIABILITY OF POULTRY. II. IRRADIATION OF EGGS BEFORE INCUBATION.] *Roczn. Nauk Rol., B, 66:* 110-111.—Ultra-violet irradiation of hen and duck eggs during the first 6 or 9 days of incubation resulted in a significant increase in the percentage hatchability. Drakes hatched from irradiated eggs grew more rapidly than those from untreated eggs; at 8 wks. they weighed 250 g. more than controls.

Preliminary experiments in Dec. 1952 on 20 eggs, with a similar number of controls, indicated that ultra-violet irradiation is also beneficial when carried out before the eggs are set. Large-scale experiments with duck eggs are to be undertaken at Pulawy and at Lublin. (Animal Breeding Abstracts)

MAHADEVAN, P. 1954. (Livestock Res. Centre, Dep. Agric., Peradeniya, Ceylon.)

FERTILITY, HATCHABILITY AND EGG PRODUCTION OF POULTRY AT THE GOVERNMENT POULTRY FARM, AMBEPUSSA, CEYLON. *Poult. Sci., 33:* 722-724.—A statistical study of some of the causes of variation in fertility and hatchability and in egg production has been made on the basis of records collected from Sep. 1951 to Aug. 1952 at the Government Poultry Farm, Ambepussa, Ceylon.

There was no significant difference in fertility between Australorps and Rhode Island Reds. There were also no significant differences in the fertility of eggs laid in the 5 mths., Oct. to Feb.

The difference in the hatchability of fertile Australorp and R.I.R. eggs was found to be significant, the Australorps having a hatchability percentage of 83.4 and the R.I.R.s 76.3. The differences in hatchability between mths. were not significant.

The av. egg production of survivors at the end of the laying year was 112.2±4.9 and 104.2±9.3 for the Australorps and R.I.R.s, resp.

The corresponding figures for the production index were 96.2 and 88.9. Age at 1st egg was 209±3 and 255±3 for the 2 breeds, resp. (Animal Breeding Abstracts)

MORENG, R. E., and BRYANT, R. L. 1954. (North Dakota Agric. Exp. Sta., Fargo.)
EFFECTS OF SUB-FREEZING TEMPERATURE-EXPOSURE ON THE CHICKEN EMBRYO. 1. SURVIVAL AND SUBSEQUENT GROWTH UP TO TIME OF HATCH. *Poult. Sci., 33:* 855-863.—Eggs containing embryos at various daily stages of development from the fertile egg up to 20 days of incubation were exposed to —10°F. for periods ranging from 70 to 125 mins. Observations were made on embryonic mortality at the time of exposure and during the incubation period following exposure.

It was found that the embryo at various stages of development differed substantially in its ability to withstand low temperature exposure. A high degree of resistance was observed for the 1st-, the 2nd-, and in some cases the 3rd-day embryo. Susceptibility to the cold was most prominently displayed by embryos when treated at the 18th, 19th or 20th days.

Exposures to —10°F. for 125 mins. killed all embryos in the majority of the age groups studied, while 70 to 90 min. exposure had little effect on embryonic mortality. Actual cause of embryonic deaths as a result of cold exposure as far as could be determined was due to haemorrhage.

Peaks in embryonic mortality following treatment were noted in the period 1-6 days and 13-19 days of incubation.

A high percentage of the embryos which survived the treatment continued to grow through the 20th day of incubation. (Animal Breeding Abstracts)

MORENG, R. E., and BRYANT, R. L. 1953. (North Dakota Agric. Exp. Sta., Fargo.)
ROOSTERS INTO ROASTERS. DIETHYLSTILBESTROL PELLETS CHANGE YOUNG MALES INTO TASTY EATING CHICKENS. *Bi-m. Bull. N. Dak. Agric. Exp. Sta., 15:* 235-241.—One group each of 10-mth-old New Hampshire, R.I.R., Barred Plymouth Rock and White Leghorn ♂♂ received one 12 mg. pellet of stilboestrol in the 1st and one in the 3rd week of a 4-wk. observation period. Body weight gains and losses due to dressing processes were highest in W.L.s and lowest in N.H.s. New Hampshires and R.L.R.s made the greatest gains during the second wks. of treatment, B.P.R.s showed the same rate of gain in the first 2 as in the last 2 wks., and W.L.s made the greatest gains during the first 2 wks. of treatment.

In a 2nd trial, groups of 8-mth-old N.H., W.L., and B.P.R. ♂♂ were given 1 or 2 pellets of stilboestrol at the start of the 4-wk. observation period. Birds receiving 2 pellets made greater gains than those receiving only 1 pellet in each case. Body weight gains, and losses due to dressing processes were greatest in B.P.R.s and lowest in N.H.s. [*See also* No. 1123.] (Animal Breeding Abstracts)

MOULTRIE, FRED, CLYDE D. MUELLER, and LOYAL F. PAYNE, (Kansas State Coll., Manhattan.)
THE EFFECT OF LIGHT ON FEATHERING OF BROILER CHICKS. *Poultry Sci. 33:* 784-790. Illus. 1954.—Variations in amt. of daily light up to 6 wks. of age had no effect on feathering in New Hampshire-White Rock cross-bred chicks, but there were significant differences in feathering attributable to variations in light provided broilers after 6 wks. of age. Chicks reared from 6 to 10 wks. or 6 to 12 wks. of age under continuous light had fewer undesirable body feathers than birds reared during that time under 5, 10, or 15 hrs. of daily light. In chicks reared after 6 wks of age under 5, 10, or 15 hrs. or light daily, there was no significant difference between the body feathering condition of birds killed at 10 wks. and those killed at 12 wks. of age. In chicks reared under continuous light, however, there was a significantly greater number of undesirable feathers at 12 wks. than at 10 wks. of age. No evidence was found of a significant difference between male and female chicks in

respect to body-feathering condition at 10 or 12 wks. of age. Feathering conditions determined by body-molt scores taken from the femoral feather tract corresponded closely to those determined by plucking and classifying individually approx. 650 feathers/bird.—*Fred Moultrie.* (Biological Abstracts)

NATT, MICHAEL P. (Eaton Labs., Norwich, N.Y.), and **CHESTER A. HERRICK.** (U. Wisconsin, Madison.)
VARIATIONS IN THE SHAPE OF THE ROD-LIKE GRANULE OF THE CHICKEN HETEROPHIL LEUCOCYTE AND ITS POSSIBLE SIGNIFICANCE. *Poultry Sci. 33:* 828-830. Illus. 1954.—The granules of the chicken heterophil leucocyte are normally rod-like in appearance. These granules are, at times, left unstable following the initial phases of the Wright and Giemsa staining procedures. When the buffered water or the dilute aqueous stain is added as is called for in the respective staining procedures, there is a partial to complete dissolution of the rod-like granule. This rod-like granule contains an inner spherical granule which is not altered in the staining procedure, and it is this remaining, centrally-located granule that imparts the abnormal spherical appearance to the heterophil granule. As a result of this phenomenon, there may result considerable confusion in distinguishing the chicken heterophil from its eosinophil.—*M. P. Natt.* (Biological Abstracts)

NEWCOMER, E. H., and BRANT, J. W. A. 1954. (Univ. Connecticut, Storrs, and FAO Tech. Mission, Dep. Agric., Peradeniya, Ceylon.)
SPERMATOGENESIS IN THE DOMESTIC FOWL. *J. Hered., 45:* 79-87.—Preliminary observations on testicular tissues of R.I.R., Barred Rock, and R.I.R.×Barred Rock fowls have not confirmed the assumption by J. C. Cross that meiosis in the fowl normally occurs at night. No periodicity in cell division was observed.

The main observations on spermatogenesis were made on smears of testicular material from R.I.R. fowls of known origin, using a new killing fluid, the composition of which is given. The chromosomes of the fowl were found to be of 2 size categories, there being 6 pairs of relatively large macro-chromosomes (3.0-6.5 μ) and an indefinite, variable number of Feulgen-positive micro-chromosomes varying in size from about 3 μ to barely visible granules. The micro-chromosomes often appear to coalesce and form aggregates approaching in size to the macro-chromosomes.

Both the genetic and the cytological evidence seem to require the designation of the micro-chromosomes as accessory chromosomes. The 6 linkage groups which have been demonstrated genetically presumably correspond to the 6 pairs of macro-chromosomes, but there are some mutant genes which do not appear to be associated with any of the 6 linkage groups. The micro-chromosomes are not necessarily genetically inert, but it would appear that the basic or fundamental genom of the domestic fowl is carried in the macro-chromosomes. The morphological identity of the sex chromosome was not established. (Animal Breeding Abstracts)

NISHIYAMA, H. 1954. (Japanese; Abstract from English summary.)
STUDIES ON THE PHYSIOLOGY OF REPRODUCTION IN THE MALE FOWL. V. THE INFLUENCE OF ANDROGEN ON THE PHALLUS AND ITS ACCESSORY ORGANS. *Sci. Bull. Fac. Agric. Kyushu Univ.:* 435-447.—The daily injection, over 25 days, of doses of testosterone acetate ranging from 0.5 to 5 mg. (total dosage 52.5 mg.), plus about 1/30 of this dose of oestrone benzoate, caused the accessory organs of the phallus of 3 adult capons to reach the size and weight of those of normal cocks. The accessory organs became functional after treatment and secreted transparent fluid. The secondary sex characters, sexual behaviour, phallus and vas deferens were also restored to normal as a result of androgen treatment. (Animal Breeding Abstracts)

PEPPER, W. F. SLINGER, S. J., and BERGEY, J. E. 1954. (Ontario Agric. Coll., Guelph.)
EFFECT OF 3-NITRO, 4-HYDROXYPHENYLARSONIC ACID

ON THE GROWTH AND SEXUAL MATURITY OF PULLETS. *Poult. Sci., 33:* 422-423.—Birds receiving the drug showed improved growth and food utilization efficiency and tended to become sexually mature at an earlier age. The pullets in both control and treated groups began to lay at about 19 wks. of age, but by 20 wks. of age the treated group had laid over 3 times as many eggs as the controls (94 v. 30). (Animal Breeding Abstracts)

PLUMART, PHILLIP E., and CLYDE D. MUELLER. (Kansas State Coll., Manhattan.)
EFFECT OF SEX-LINKED EARLY FEATHERING ON PLUMAGE FROM 6 TO 12 WEEKS OF AGE. *Poultry Sci. 33:* 715-721. 1954.—Feathering of broilers was studied by classifying individual feathers according to degree of maturity. Counts were made of 38,810 feathers from 142 chicks. Pullets with the sex-linked gene for early feathering possessed considerably better back feathering than did late feathering pullets at 6, 8, and 10 wks., but pullets of the 2 types showed little difference at 12 wks. Early feathering cockerels had greater maturity of back feathers than did late feathering ones at all 4 ages. Among 237 chicks dressed at 12 wks. of age, the early feathering chicks had a better dressed appearance than did the late feathering ones. Visual classification of feathering in live chicks at 6 wks. provided an excellent indication of the degree of maturity of plumage up to the age of 12 wks.—*C. D. Mueller.* (Biological Abstracts)

RIGDON, R. H., G. CRASS, and KENNETH P. McCONNELL. (U. Texas Med. Branch, Galveston.)
INHIBITION OF MATURATION OF DUCK ERYTHROCYTES BY SODIUM SELENITE. THE COUNTERACTION OF THIS EFFECT BY CYSTEINE. *Arch. Pathol. 56:* 374-385. 1953.—White Pekin ducks given sodium selenite show an anemia and a decrease in the percentage of reticulocytes in the peripheral blood. The bone marrow becomes hypoplastic with a decreased erythroid-myeloid ratio. The decrease in erythroid cells is most marked at the megaloblast level. There is a decrease in the number of mitotic figures in the erythroblasts but no abnormal cells are noted. The effect of selenium on the hematopoietic system is counteracted by cysteine, suggesting that the selenium inhibits an enzyme system dependent on the sulfhydryl for its activity.—From auth. abst. (Biological Abstracts)

SAVVATEEV, V. B. 1954. (Pavlov Inst. Physiol., Acad. Sci. U.S.S.R.)
VLIJANIE VNESNEGO TORMOZENIJA NA PROCESS JAICEKLADKI U KUR. [THE EFFECT OF ENVIRONMENT ON THE INHIBITION OF LAYING HENS.] *Z. Obsc. Biol., 15:* 128-137.—Transference to cages without nests delayed laying for 4-16 days in birds in which the clutch sequence was established. Laying was delayed in 6 out of 9 birds transferred to similar cages with nests; it was not appreciably affected in the other 3 birds. In birds which had been isolated, laying was not affected when they were returned to the flock but was delayed when they were again isolated. The presence of a dog near the cage delayed laying. After initial delay subsequent changes of cage had no appreciable effect. Two birds each produced 2 eggs, the second of which was without a shell, after laying was delayed. (Animal Breeding Abstracts)

SIMON, K. J. 1952.
OBSERVATIONS ON STILBOESTROL IMPLANTATION IN COCKERELS. *Indian Vet. J., 28:* 439-443.—Three separate tests in which 4- to 5-month-old cockerels were implanted just behind the head with 15 mg. pellets of stilboestrol resulted in a reduction of ♂ characteristics, increased hardness of bone, and the production of fatter and softer, better-flavoured meat than that of the controls. There was no increase in weight gain. Six wks. after implantation the residue of the pellets was still active. The heads of chemically caponized birds should therefore be discarded. (Animal Breeding Abstracts)

SKALLER, F., T. E. ALLEN, and R. L. SHELDON. 1954. (Poult. Res. Centre, Werribee, Vict.) [Author's summary.]
THE EFFECT OF INTENSITY OF DAYLIGHT ON EGG PRODUCTION OF FOWLS IN CAGES. *Aust. J. Agric. Res., 5:* 578-583.—Fowls kept in individual laying cages may be exposed to very different intensities of daylight according to the position of the cage in relation to the source of light. Daylight-intensity readings in 2 buildings housing laying-cage batteries varied from 1-8 ft. candles at 4:30 p.m. and 7-11 ft. candles at 9:30 a.m., in positions of low light, to 16-35 ft. candles at 4:30 p.m. and 65-172 ft. candles at 9:30 a.m. in positions of high light. Analysis of records from 170 pullets from selected positions showed no significant difference among egg production of birds exposed to this range of light intensities. (Animal Breeding Abstracts)

SMITH, A. H., WILSON, W. O., and PACE, N. 1954. (Univ. California, Davis, Univ. California, Berkeley, and White Mountain High Altitude Res. Sta., Big Pine.)
THE EFFECT OF HIGH ALTITUDE ON THE GROWTH OF TURKEYS. *Growth, 18:* 27-35.—Day-old Broad-Breasted Bronze turkey poults were brooded and subsequently reared at an altitude of 10,500 ft. The rate of growth and attainment of sexual maturity was equivalent to that observed with similar stock at sea level. Anatomic studies indicated that a relative increase in heart size was the principal developmental change. The increases in lung and spleen size observed in mammals were not found in these birds. *(Authors' summary and conclusions.)* (Animal Breeding Abstracts)

STAMLER, JEREMIAH, RUTH PICK, and LOUIS N. KATZ. (Michael Reese Hosp., Chicago.)
ESTROGEN PROPHYLAXIS OF CHOLESTEROL-INDUCED CORONARY ATHEROGENESIS IN CHICKS GIVEN ADRENAL CORTICOIDS or ACTH. *Circulation 10(2):* 247-250. 1954.—Estrogen prophylaxis of cholesterol-induced coronary atherogenesis in cockerels is unimpaired by concomitant exhibition of adrenal steroids or ACTH.—*J. Stamler.* (Biological Abstracts)

STEPHENSON, A. B. 1953. (Utah Agric. Exp. Sta., Logan.)
EFFECT OF HOLDING ON HATCHABILITY OF TURKEY EGGS. *Farm Home Sci.* [*Utah Agric. Exp. Sta.*], *14:* 14-15, 23.—Records kept over a 3-yr. period at the Utah Agricultural Experiment Station showed that hatchability of turkey eggs decreased by an average of 2.1% for each day the eggs were held before setting; hatchability decreased most rapidly (4.3% per day) in eggs set in Feb. and least rapidly (0.71% per day) in eggs set in April. There were no significant strain differences. The results of similar investigations at other Experiment Stations are mentioned. (Animal Breeding Abstracts)

STURKIE, P. D., and POLIN, D. 1954. (New Jersey Agric. Exp. Sta., New Brunswick.)
ROLE OF THE MAGNUM AND UTERUS IN THE DETERMINATION OF ALBUMEN QUALITY OF LAID EGGS. *Poult. Sci., 33:* 9-17. (Animal Breeding Abstracts)

TANAKA, T., and M. M. ROSENBERG. (U. Hawaii, Honolulu.)
RELATIONSHIP BETWEEN HEMOGLOBIN LEVELS IN CHICKENS AND CERTAIN CHARACTERS OF ECONOMIC IMPORTANCE. *Poultry Sci. 33:* 821-827. 1954.—The hemoglobin levels in males was significantly higher than that in females from 24 to 80 wks. of age, but not prior to 22 wks. In males the level steadily increased to 46 wks. and then gradually decreased. In females the level only increased to the 20th wk., dropped sharply and continued to fall to the 28th wk., increased to the 36th wk., with no definite trend thereafter. Pullets in production had lower hemoglobin levels than those out of production, and good producers had lower levels than poor producers. The same individual showed significantly higher values during periods of non-production than during periods of production. Body wts. at 6, 12, 18 and 24 wks. were not associated with hemoglobin levels. The hemoglobin level,

because of its variation is not a reliable guide for identification of egg-production genotypes.—*H. Branion.* (Biological Abstracts)

TOMHAVE, A. E. 1954. (Delaware Agric. Exp. Sta., Newark.) [Author's summary.]

INFLUENCE OF ARTIFICIAL LIGHTS DURING REARING ON THE EGG PRODUCTION OF OCTOBER HATCHED NEW HAMPSHIRES. *Poult. Sci., 33:* 725-729.—This investigation was carried on to determine the influence of artificial lights during the growing period upon the sexual maturity and subsequent egg production of Oct.-hatched birds.

The pullets reared with supplementary artificial lights reached 25 and 50% production 7 and 14 days later, resp., than did controls. Sexual maturity was therefore somewhat delayed by use of artificial lights.

The percentage of eggs weighing 23 oz. and more and 22 oz. and more per dozen was increased significantly during 164 days of production by the use of artificial lights during the growing period.

The live weight of pullets at 24 wks. of age was slightly greater in the lots reared with supplementary artificial lights. The feed required to produce 1 lb. gain was slightly lower in these lots, but this difference may have been due to the greater egg production to 24 wks. of age by the control pullets.

There was very little difference in mortality, rate of lay, and hatchability of eggs between the 2 lots of pullets during a laying period of 164 days. (Animal Breeding Abstracts)

UBBELS, P. (?1953). English summary.

BROEDERIJPROEVEN OP HET RIJKSINSTITUUT VOOR PLUIMVEETEELT TE BEEKBERGEN. [INCUBATION EXPERIMENTS AT THE STATE POULTRY INSTITUTE AT BEEKBERGEN.] *Meded. Rijksinst. Pluimveeteelt* [*Beekbergen*], No. 50: 12 pp.—An account is given of various experiments undertaken at Beekbergen, with the co-operation of the Animal Husbandry Research Institute of the Organization for Applied Scientific Research (T.N.O.), to ascertain the difference in hatchability between eggs turned once an hour during incubation and eggs turned only 3 times in the daytime. Tests were carried out with both small (capacity 500 eggs) and large (capacity 16,000 eggs) incubators. When large incubators similar to those generally employed by breeders and hatcherymen in the Netherlands were used, hatchability over a 14-wk. period in Sep.-Dec. 1952 was 68.3% for eggs turned 3 times daily v. 74.3% for eggs turned 24 times—a difference of 6% in favor of the more frequently turned eggs. When the eggs used were of a type that gave a high percentage of hatchability (77%) under the 3-turnings system, the difference in favor of 24 turnings was less (3%) but still of practical value. (Animal Breeding Abstracts)

WILWERTH, A. M., C. MARTINEZ-CAMPOS, and E. P. REINEKE. 1954. (Michigan Agric. Exp. Sta., East Lansing.) Author's summary.

INFLUENCE OF THE THYROID STATUS ON VOLUME AND CONCENTRATION OF COCK SEMEN. *Poult. Sci., 33:* 729-735.—The feeding of 0.1% thiouracil to Rhode Island Red cocks caused a small, but statistically nonsignificant, trend toward lower semen volume and concentration. Replacement of the thiouracil with 0.01, 0.02 and 0.04% thyroprotein caused a significant increase in semen volume, the greatest effect being observed at the highest dosage level.

In a 2nd experiment 0.04% thyroprotein significantly increased sperm concentration with no effect on semen volume. Higher levels (0.08 and 0.16%) significantly decreased both semen volume and concentration. (Animal Breeding Abstracts)

YAWASHINA, Y. 1952. (Yamashina's Inst. Orn. Zool., Tokyo.)

NOTES ON EXPERIMENTAL BROODING INDUCED BY PROLACTIN INJECTIONS IN THE DOMESTIC COCK. *Annot. Zool. Jap., 25:* 135-140.—By testing the response of cocks of various breeds to prolactin it was hoped to determine the amount of broodiness in their genetic make-up, so that the use of ♂ birds likely to transmit broodiness to their ♀ progeny could be avoided. Of 6 cocks treated with prolactin, 2 failed

to exhibit broody behaviour. Individual differences were observed in the response of the other birds. Histological examination of the testes of a broody cock revealed that the seminal tubules were very narrow and the interstitial cells highly developed. No spermatozoa were present. In a bird which had lost its broodiness spermatogenesis was normal. (Animal Breeding Abstracts)

YASUDA, M. (Fac. Agric., Nagoya U., Nagoya.)
CYTOLOGICAL STUDIES OF THE ANTERIOR PITUITARY IN THE BROODY FOWL. *Proc. Japanese Acad. 29:* 586-593. 1953.—Cytological and histological changes in the anterior pituitary in the broody fowl are studied. The pituitary of the broody hen shows a marked change in the number and appearance of acidophile cells. These cells secrete prolactin which is responsible for the characteristic behavior of the broody hen.—*T. Komai.* (Biological Abstracts)

NUTRITION

BEGIN, J. J., and P. A. THORNTON. (Kentucky Agric Exp. Sta., Lexington.)
RESPONSE OF HORMONE-INJECTED NEW HAMPSHIRE CHICKENS TO ANTIBIOTIC SUPPLEMENTATION. *Poultry Sci., 33:* 212-214. 1954.—Eight groups of 8 male and 8 female day-old chicks were given a maize and soya bean oilmeal ration with or without 10 mg. bacitracin per lb. feed. At 4 and 38 days of age, 4 males from each group were given a 20 mg. tablet of diethylstilboestrol subcutaneously in the neck and 4 females of each group had 20 mg. testosterone propionate similarly administered. Without the hormone, bacitracin feeding produced a 5 per cent smaller gain in females and a 7 per cent greater gain in males. All birds that received the hormone grew more slowly than the controls and the effect of bacitracin on these birds was similar to that in the untreated birds. The dose of hormone was sufficient to modify the secondary sex characters, but not to modify the differential sex response to antibiotic supplementation.—*M. J. Head.* (Nutrition Abstracts and Reviews)

BLAYLOCK, L. G., J. R. HUNT, F. ZIEGLER, E. B. PATTERSON, and W. J. STADELMAN. (Washington State Coll., Pullman.)
THE EFFECT OF ENERGY LEVEL OF THE DIET ON GROWTH FEED EFFICIENCY AND DEGREE OF FATTENING OF TURKEYS. *Poultry Sci. 33:* 864-866. 1954.—The greatest wt., efficiency of feed utilization and degree of fattening was obtained with turkeys fed a high energy pelleted mash with supplemental whole corn from 8-23 wks. of age. This diet was superior to a high energy pelleted mash fed with whole barley or a low energy pelleted mash fed with whole corn. The efficiency of feed utilization paralleled the total fiber intake more closely than the energy or protein intake. However, neither fiber nor energy intake alone will explain the results found and it appears that a complex relationship exists between these factors.—*L. G. Blaylock.* (Biological Abstracts)

BRIGGS, G. M., and M. R. SPIVEY. (Lab. Biochem., Nat. Inst. Health, Bethesda, Md.)
GROWTH-STIMULATORY EFFECT OF LACTOSE ADDED TO SYNTHETIC DIETS FOR CHICKS. *Federation Proc., 13:* 452. 1954.—(Nutrition Abstracts and Reviews)

BROWN, W. O. (Minist. Agric. N. Ireland.)
THE EFFECT OF ANTIBIOTICS ON THE GROWTH RATE OF CHICKS FED HIGH QUALITY DIETS. *Res. Exp. Rec. Minist. Agric. N. Ireland,* 54-59. 1952.—Duplicate groups of Light Sussex pullet chicks were reared on litter in a brooder house and fed to 8 weeks of age on a ration (A) made up of livermeal 10, fishmeal 5, groundnut meal 5, cod liver oil 2, limestone 1, wheat feed 25, ground barley 15 and maizemeal to 100; their mean weight gain was 775 g. Further groups fed on a similar ration (B), with the livermeal replaced by dried skimmed

milk and the level of fishmeal increased to 10 per cent at the expense of maizemeal, had a mean gain of 795 g. Parallel groups receiving rations A and B each supplemented with 20 g. (misprinted as 4.0 g. in Table VI) procaine penicillin per ton had mean weight gains of 870 and 945 g., respectively. This mean increase of 15 per cent in growth rate with the antibiotic was accompanied by a 10 per cent improvement in efficiency of feed utilization despite the high quality of the basal rations.

In two further trials, one in wire-floored cages and one using floor pens, there was a tendency for both terramycin and procaine penicillin, both used at a level of 4 g. per ton of feed, to increase growth by about 7 per cent, but the differences were not statistically significant with the numbers used.—*K. J. Carpenter.* (Nutrition Abstracts and Reviews)

CARLSON, C. W., E. GUENTHER, WM. KOHLMEYER, and O. E. OLSON. (S. Dakota Agric. Expt. Sta., College Station.)

SOME EFFECTS OF SELENIUM, ARSENICALS, AND VITAMIN B_{12} ON CHICK GROWTH. *Poultry Sci. 33:* 768-774. 1954.—Selenium from yellow corn at 10 ppm. in the diet was not detrimental to chick growth, whereas, the same level from sodium selenite markedly reduced growth. Sodium arsenite, arsanilic acid, and 3-nitro-4-hydroxyphenylarsonic acid were effective in improving growth of chicks fed practical diets or diets containing 10 ppm. of selenium. The arsenicals were only partially effective in counteracting the growth retarding effect of selenium. Vit. B_{12} was required for the manifestation of selenium toxicity. Different types of chicks showed a differential tolerance to selenium poisoning and a differential response to arsenical treatment.—*C. W. Carlson.* (Biological Abstracts)

CARPENTER, K. J. (Rowett Res. Inst., Bucksburn, Aberdeenshire).

THE PLACE OF NEW PRODUCTS IN POULTRY FEEDING. *J. Dept. Agric., Republic of Ireland,* 1952-53, *49,* 106-115. (Nutrition Abstracts and Reviews)

COUCH, J. R. (Texas A. and M. Coll., College Station.)

HERE'S PLAIN TALK ON POULTRY NUTRITION. *Western Feed and Seed 9(4):* 30, 46, 48; (5): 23, 30, 61-64. 1954.—A review article on results of recent research in poultry nutrition including results with low fiber feeds, vit. B_{12}, antibiotics, other identified and unidentified growth factors, and the chick hemorrhagic disease.—*J. F. Harrington.* (Biological Abstracts)

DENTON, C. A., R. J. LILLIE, and J. R. SIZEMORE. (Bur. Anim. Indust., U.S. Dept. Agric., Beltsville, Md.)

EFFECT OF EGG YOLK, FAT AND FISH SOLUBLES ON GROWTH OF CHICKS. *Federation Proc., 13:* 455. 1954. (Nutrition Abstracts and Reviews)

FRONDA, F. M., and DIOMEDES G. FLORES. (University of the Philippines, College of Agriculture, College, Laguna, Philippines).

IODIZED CASEIN IN A RATION FOR LAYING HENS. *Philippine Agric. 37:* 23-27. 1953.—Iodized casein fed to Los Banos Cantonese and S.C. White Leghorn layers did not significantly increase egg production, but it caused a reduction in the amount of feed needed to produce a dozen eggs and significantly increased the size and hatchability of the eggs produced. It did not influence the amount of feed consumed, the weight of the birds, and their mortality.—*F. M. Fronda.*

JACOBS, R. L., J. F. ELAM, G. W. ANDERSON, L. L. GEE, JEAN FOWLER, and J. R. COUCH. (Texas A. and M. Coll. System, College Station.)

FURTHER EVIDENCE AS TO THE POSSIBLE MECHANISM INVOLVED IN THE GROWTH-PROMOTING RESPONSES OBTAINED FROM ANTIBIOTICS. *Jour. Nutrition 51:* 507-513. 1953.—Data from 2 separate expts. are presented in which 375 chicks were tested. The birds were housed in a clean room which was washed 2 wks. before. The room was washed daily during the entire exptl. period. An all-vegetable protein diet was supplemented with various antibiotics, p-

chlorophenylarsonic acid and furazolidone to determine the effect on growth and the total number of clostridia. Under clean conditions neither antibiotic increased the rate of growth or decreased the total number of clostridia/g. of feces. Low clostridia content was also noted in the basal group under these conditions. This is further evidence that antibiotics stimulate growth by reducing the total number of clostridia in the intestinal tract of the chick and are ineffective in stimulating growth in a clean environment where the clostridia population is low.—*Auth.* (courtesy Wistar Bibl. Serv.)

JENSEN, L. S. (Cornell U., Ithaca, N.Y.)
TURKEY HEN NUTRITION. *Western Feed and Seed 8(12):* 28, 44. 1953.—Tested rations to which were added vit. E, niacin, and grass juice. Compared body wt., egg production, feed consumption, and hatchability. Added niacin had no effect. Vit. E increased hatchability from 30-40% to 70-90%. Grass juice accelerated growth and reduced mortality of poults.—*J. F. Harrington.* (Biological Abstracts)

KATIGBAK, TEODORO V. (University of the Philippines, College of Agriculture, College, Laguna, Philippines).
THE INFLUENCE OF THREE RATIONS ON GROWING CHICKS. *Philippine Agric. 37:* 175-184. 1953.—The ration containing 10 parts copra meal, 15 parts fish meal, and one part Aurofac promoted better growth than the ration with 5 parts copra meal, 20 parts fish meal, and no Aurofac. Reducing the fish meal to 10 parts and increasing the copra meal to 15 parts produced inferior weanlings even with Aurofac supplement.—*F. M. Fronda.*

KINDER, Q. B., and H. L. KEMPSTER.
EXPERIMENTS IN CHICK FEEDING 1947-1952. *Missouri Agric. Expt. Sta. Res. Bull.* No. 525, July 1953, pp. 24.—In the large series of growth tests described the rations were based on yellow maizemeal and soya bean meal, deficient in riboflavin. Riboflavin was added as alfalfa meal, dried milk or crystalline riboflavin and the effect was also tested of addition of meat scrap, fishmeal and iodinated casein.

In battery tests addition of alfalfa meal, though preventing curled toe, tended to depress growth to 8 weeks, each 1 per cent addition over the 1.5 per cent level depressing growth by nearly 2 per cent; 5 per cent alfalfa supplied all the riboflavin required, since the further addition of crystalline riboflavin gave no extra growth response. Crystalline riboflavin could replace dried milk or alfalfa as a source of riboflavin. Replacement of part of the soya bean meal by 5 per cent fishmeal gave a 10 per cent increase in rate of growth and improved efficiency of feed. The continuous addition of iodinated casein, 18 g. per 100 lb. feed, depressed growth but the effect was less marked if the ration contained fishmeal. The use of wheat by-products instead of whole wheat, had an adverse effect on growth and feed use. Dried fermentation solubles was a satisfactory source of riboflavin.

From a series of tests on the value of adding vitamin B_{12}, antibiotics and fishmeal to a maize and soya bean meal ration, singly or in combination, it was concluded that vitamin B_{12} improved growth rate by about 9 per cent, antibiotics by a further 8 per cent, and fishmeal by a further 5 per cent. Under farm brooding conditions built-up litter improved growth rate to 8 weeks only if the ration was deficient in animal protein and vitamin B_{12}. The use of 15 to 20 per cent of wheat shorts and bran reduced the energy value of the ration of soya bean meal and maize by 2.6 Therms per 100 lb. and resulted in a 2 to 2½ per cent decrease in growth rate and use of feed was less efficient by 6 per cent.—*J. S. Thomson.* (Nutrition Abstracts and Reviews)

LANSON, R. K. (U. Maine, Orono.)
POULTRY PELLETS. *Feed Bag 30(6):* 25. 1954.—Pellets were fed to broiler pullet chicks in comparison with mash and a combination of pellets and mash. Pellets produced the heaviest weights at 10 and at 12 wks., the greatest return over feed cost, and the best feed conversion. There was little difference in mortality and no evidence of cannibalism.—*H. L. Wilcke.* (Biological Abstracts)

LILLIE, ROBERT J., H. R. BIRD, J. R. SIZEMORE, W. L. KELLOGG, and C. A. DENTON. (U.S. Dept. Agric., Beltsville, Md.)
ASSAY OF FEEDSTUFFS AND CONCENTRATES FOR VITAMIN B_{12} POTENCY. *Poultry Sci 33:* 686-691. 1954.—Studies were conducted with chick and microbiological assays to establish the vit. B_{12} potencies feedstuffs and concentrates commonly used in poultry feeds. Similarity in the vit. B_{12} potencies obtained by chick and microbiological assays was observed with several sludge prepns., defatted liver substance, crab meal, fish meals, broiler viscera meal, dried skim milk, and dried whey. Commercial B_{12} concentrates B and C, 2 liver prepns., fish solubles, meat meal, egg yolk and several sewage sludge prepns. showed disimilarity in their vit. B_{12} potencies. The B_{12} values for these materials except the sewage sludge prepns. were greater for the chick assay than for the microbiological assay. The commercial B_{12} concentrates and sewage sludge prepns. were the only materials of all assayed that contained one or more mcg. of vit. B_{12}/g.—*R. J. Lillie.* (Biological Abstracts)

McCLYMONT, G. L., and D. C. DUNCAN.
GROUND LIMESTONE AND LIMESTONE CHIPS; EFFICIENT REPLACEMENTS FOR SHELL GRIT FOR LAYERS. *Agric. Gaz. N. South Wales 65(3):* 148-149. 1954.—An expt. at Seven Hills Poultry Exp. Sta. used 16 pens of 10 Leghorn hens each, in small intensive houses, one lot being fed no Ca supplement, the other 3 lots fed shell grit, limestone chips, and ground limestone, respectively, with an all-mash ration. After 365 days, the results showed no significant difference in amt. of food consumed, but those with Ca supplements produced more eggs, with thicker shells, heavier mean wt. An insoluble grit supplement, crushed blue metal, used when intensively housed without access to suitable pebbles in soil, was eaten in larger amts. by the birds having no Ca supplement. When shell grit is more costly or difficult to obtain, ground limestone or limestone chips can therefore furnish the needed supplements.—*L. G. McNeill.* (Biological Abstracts)

McDONOGH, S. J. (Dept. Agric., Dublin.)
ASPECTS OF POULTRY NUTRITION IN THE UNITED STATES OF AMERICA. *J. Dept. Agric., Republic of Ireland,* 1952-53, *49,* 116-157. (Nutrition Abstracts and Reviews)

MACHLIN, L. J., J. T. JACKSON, A. H. LANKENAU, and P. B. PEARSON. (Animal and Poultry Husbandry Res. Branch, U.S.D.A., Beltsville, Md.)
UPTAKE OF S^{35} IN THE FEATHERS, GIZZARD LINING, LIVER AND MUSCLE OF YOUNG CHICKENS AFTER INJECTION WITH RADIOACTIVE METHIONINE OR SULFATE. *Poultry Sci. 33:* 234-238. Illus. 1954—The uptake and loss of S^{35} in several tissues after injn. of young chickens with S^{35}-labeled methionine was detd. There was a rapid loss in the liver and gizzard lining, whereas muscle lost S^{35} slowly. Uptake of radioactive sulfate in the gizzard lining was greater than in any other tissues studied. Radioactive cystine was found in the feathers of growing birds injected with either S^{35}-labeled Na sulfate or methionine. Data were presented which suggest that once deposited in the feather, cystine and methionine are metabolically inert. Radioautographs were used to show the exact location of radioactivity in the feathers.—*L. J. Machlin.* (Biological Abstracts)

MELLEN, W. J. (U. Delaware, Newark), **F. W. HILL, and H. H. DUKES.** (Cornell U., Ithaca, N.Y.)
STUDIES OF THE ENERGY REQUIREMENTS OF CHICKENS. 2. EFFECT OF DIETARY ENERGY LEVEL ON THE BASAL METABOLISM OF GROWING CHICKENS. *Poultry Sci. 33:* 791-798. 1954.—The expts. reported concerned detns. of the fasting O_2 consumption of growing chickens reared on rations containing widely different productive energy levels but otherwise nutritionally similar. O_2 consumption measurements were made by the Haldane gravimetric method, and the influence of body wt. differences was removed by covariance analysis. The fasting O_2 consumption of growing male chickens reared on a ration containing 975 calories of productive energy/lb. was consistently

and significantly higher than that of similar chicks fed a ration containing 505 calories/lb. in 2 expts. Body wts. of chicks reared on the different rations were approx. equal. It was hypothesized that the observed differences in basal metabolisms were related to differences in body composition which, as shown previously in these laboratories, result from feeding rations differing in energy content. In contrast to the results obtained with male chicks, females showed no significant effect of dietary history on fasting O_2 consumption, using the same diets as employed with the males. The effect of dietary energy level apparently did not involve the thyroid gland directly, since no significant effect of energy level on thyroid size was found.—*F. W. Hill.* (Biological Abstracts)

MOLINA, DOMINGO G. (University of the Philippines, College of Agriculture, College, Laguna, Philippines).
THE INFLUENCE OF 5 AND 10 PER CENT LEVELS OF IPIL-IPIL *(LEUCAENA GLAUCA)* LEAF MEAL IN THE COLLEGE ALL-MASH RATION FOR CHICKS. *Philippine Agric. 37:* 142-147. 1953.—Of the two levels of ipil-ipil leaf meal used, the 5 per cent level was found to be better. The results clearly indicate that the inclusion of ipil-ipil leaf meal in the College all-mash growing ration improves its growth promoting value.—*F. M. Fronda.*

MONSON, W. J., A. E. HARPER, M. E. WINJE, C. A. ELVEHJEM, R. A. RHODES, and W. B. SARLES. (U. Wisconsin, Madison.)
A MECHANISM OF THE VITAMIN-SPARING EFFECT OF ANTIBIOTICS. *Jour. Nutrition 52:* 627-636. 1954.—The growth of chicks fed synthetic diets containing limiting amts. of folic acid was increased by supplementing the diets with antibiotics. Increased growth was accompanied by the appearance of one or more strains of coliforms in the ileum and duodenum contents that produced increased amts. of folic acid. This change was apparent in 2 days in the ileum of 4-wk.-old chicks. It was also observed that the increased folic acid production was correlated with increased liver folic acid, but there was no change in the concn. of intestinal folic acid. These results explain at least in part the mechanism by which antibiotics spare vits. for the chick.—*Auth.* (courtesy Wistar Bibl. Serv.).

OLOUFA, M. M. 1954. (Coll. Agric., Univ. Cairo.)
INFLUENCE OF THYROPROTEIN AND DARKNESS ON EGYPTIAN CHICKEN DURING SUMMER. *Poult. Sci., 33:* 649-652.—Three groups of Egyptian hens, each consisting of 45 birds aged 2-3 yrs. were used in experiments lasting from 1st June to 31st Aug. 1953. The group fed thyroprotein, at a rate of 5 g. per 100 lb. feed, produced 13% more eggs than the control group (1347 v. 1037). The increase was greatest during the months of June and July. The difference between these groups in mean egg weight was not statistically significant. Hens fed thyroprotein showed a slight decrease in body weight as the experiment proceeded. Mortality was the same in both groups.

Hens in the 3rd group were subjected to 2 hrs. darkness daily (12 noon-2 p.m.); they produced 6.24% more eggs than did the controls over the whole period of the experiment, although the control group produced more eggs during Aug. It was found that the increase in production in June-July was due to the effect of lower temperature rather than to darkness. (Animal Breeding Abstracts)

O'NEIL, J. B. (Dept. Poultry Husb., Univ. Saskatchewan, Saskatoon.)
CONCENTRATE PELLETS AND WHOLE GRAIN AS A METHOD OF FEEDING LAYING HENS. *Canad. J. Agric. Sci., 34:* 131-136. 1954.—In egg production, efficiency (lb. feed per dozen eggs laid) and general health, there was no difference between 4 groups of New Hampshire × Barred Plymouth Rock pullets of which group 1 received a commercial concentrate mash to appetite and whole grain twice daily; group 2 was fed like group 1 but was given the same amount of grain in one feed daily; group 3 had an all-mash ration in which the grain was ground and incorporated with the concentrate, and group 4 was fed to appetite with the concentrate in pellet form and mixed with the whole grains. In all groups the ratio of concentrate to grain was 1:7.

Economic advantages claimed for the new method (group 4) are that the grain is not ground or hand-fed and the ration is easily mixed. The effect of the method on hatchability is being studied, and so far the results have been satisfactory.—*T. D. Bell.* (Nutrition Abstracts and Reviews)

PAJARILLAGA, PROSPERO B. (University of the Philippines, College of Agriculture, College, Laguna, Philippines.)
THE INFLUENCE OF SOIL IN THE COLLEGE RATION FOR GROWING CHICKS. *Philippine Agric. 37:* 148-153. 1953.—Supplementing the College all-mash chick ration with 2 per cent soil did not produce a marked advantage in the average weight at 12 weeks of age and in rate of mortality. Based, however, on 100 chicks raised to 12 weeks of age, the returns above cost of feed were a bit higher for the soil-supplemented lot than for the control lot.—*F. M. Fronda.*

PATTERSON, E. B. and J. McGINNIS. (Dept. of Poultry Sci., Washington State Coll., Pullman.)
INFLUENCE OF HEN DIET ON GROWTH RESPONSE OF CHICKS TO DIFFERENT SOURCES OF UNIDENTIFIED GROWTH FACTORS. *Federation Proc. 13:* 472. 1954. (Nutrition Abstracts and Reviews)

PETERSON, D. W., C. R. GRAU, and N. F. PEEK. (Dept. Poultry Husb., Univ. California, Berkeley.)
GROWTH AND FOOD CONSUMPTION IN RELATION TO DIETARY LEVELS OF PROTEIN AND FIBROUS BULK. *J. Nutrition, 52:* 241-257. 1954.—Chicks were fed from 9 to 29 days of age on a series of rations, each containing 2 per cent. soya bean oil and minerals and vitamins believed to cover their requirements with an ample margin. Boned acetone-extracted fishmeal, of known good quality, and rice hull cellulose were variable components, and each ration was completed with sucrose. With fishmeal contributing 21.3 per cent protein and no cellulose, chicks had a growth rate of 6.3 per cent per day, calculated in terms of their mean bodyweight over the test period; with 12, 24, 36 and 48 per cent of cellulose growth rates were 6.6, 6.0, 5.3 and 2.3 per cent, respectively. With increasing levels of cellulose, up to 24 per cent, feed consumption increased so that the intake of "metabolisable calories" remained constant. For the rations containing 36 and 48 per cent cellulose the volume of feed eaten remained the same as for the 24 per cent ration, and the energy intake was therefore reduced.

Rations of lower protein content were also tested. In the extreme case a ration with 5.3 per cent protein and no cellulose failed to allow any growth; but the same ration supplemented with 12, 24 and 36 per cent cellulose allowed increasing growth rates, 2.2 per cent per day at the last level. Carcase analysis of selected birds showed that those that had received low-protein rations contained less protein but more fat than normal chicks. The addition of 12 and 24 per cent cellulose reduced the fat content of the carcases, regardless of the protein content of the rations.

It is concluded that chicks normally adjust their feed intake to provide them with "metabolisable calories" in a quantity related to their body size. There is, however, an upper limit to the bulk that they can take in. Growth will normally be limited by energy intake; but with rations low in protein this will be the limiting factor. The apparent growth stimulation by cellulose with the 5.3 per cent protein ration is thus explained as being directly due to the greater feed and therefore greater protein intake as the energy content of the ration is reduced.

In a further trial the addition of either 2.0 per cent calcium gluconate or 0.1 per cent levulinic acid to the same type of ration had no growth-stimulating effect. Levels of both 15 and 20 per cent protein were used, and the trial was replicated with and without the addition of 12 per cent cellulose.—*K. J. Carpenter.* (Nutrition Abstracts and Reviews)

RICHARDS, J. S. 1954. (Nat. Agric. Advis. Serv., Yorks and Lancs Province.)
BROILERS. A YORKS NORTH RIDING EXPERIMENT. *Agri-*

culture [*Lond.*], *61:* 123-126.—Three treatments were compared, using 600 birds in each group + a control group. Live weight at 14 wks. and feed conversion were similar in groups either caponized or fed a supplement consisting of an antibiotic and a derivative of phenyl-arsonic acid as a growth stimulant (4.7 and 4.66 lb. resp. at 14 wks.). The 3rd group received supplements and was caponized but the results were no better than for the control group (4.48 lb. and 4.46 lb. resp. at 14 wks.).

The rate of gain in live weight decreased after 4¼ lb. was reached between the 12th and 14th weeks. It is not therefore considered economical to fatten birds beyond this weight. (Animal Breeding Abstracts)

ROSENBERG, M. M. (U. Hawaii, Honolulu.)
NAPIER GRASS (PENNISETUM PURPUREUM) MEAL, A SUBSTITUTE FOR ALFALFA MEAL IN CHICK STARTER RATIONS. *Poultry Sci. 33:* 803-809. 1954.—Napier grass *(Pennesitum purpureum)* is a perennial plant that is widely used in Hawaii as a green fodder crop by the dairy industry. Its distinctive features are aggressiveness, long life, drought resistance, high productivity, adaptability to mechanical harvesting, and ability to recover after being cut. The entire plant was harvested at weekly intervals ranging from 3 to 14 wks. since last cutting. Under our conditions of environment and management, the inflorescence had not emerged at 14 wks. Upon being chopped, dehydrated in an electric oven, and ground in a hammer mill, the Napier meal was substituted for alfalfa meal, imported from mainland United States, at the rate of 5% of total ration. It was found that chicks grew as well as their respective controls to 21 days of age when fed all these meals. Whereas efficiency of feed conversion tended to be somewhat in favor of the exptl. rations when the Napier meals were prepared from 3-to-10-wk.-old cuttings, the meals prepared from samples cut at 11, 12, 13, and 14 wks. were variable in efficiency although essentially as good as imported alfalfa meal. When neither alfalfa meal nor Napier meal was included in the basal ration, growth rate was significantly depressed. The data show that Napier meal can effectively replace alfalfa meal in chick starter rations. This finding may have economic applicabilty because, in contrast to alfalfa, Napier grass can be grown efficiently and economically in the tropics.—*M. M. Rosenberg.* (Biological Abstracts)

SAN JUAN, MARIO O. (University of the Philippines, College of Agriculture, College, Laguna, Philippines).
DRIED BREWERS' YEAST AS A SUPPLEMENT TO A RATION FOR GROWING CHICKS. *Philippine Agric. 37:* 57-63. 1953.—From the point of view of economy of meat production, dried brewers' yeast may be profitably utilized in rations for growing chicks, in the proportion of one to ten. The birds in the control lot were not significantly heavier than those in the experimental lot, there was no significant difference in the mortality, and the returns above feed cost was practically the same in both lots.—*F. M. Fronda.*

SCHAEFER, A. E., R. D. GREENE, H. L. SASSAMAN, and S. WIND. (E. R. Squibb and Sons, New Brunswick, N.J.)
FERMENTATION MEALS AS SOURCE OF UNIDENTIFIED CHICK GROWTH FACTORS. *Federation Proc., 13:* 476. 1954. (Nutrition Abstracts and Reviews)

SLINGER, S. J., W. F. PEPPER, and D. C. HILL. (Dept. Poultry Husb., Ontario Agric. Coll., Guelph.)
HIGH LEVELS OF ANTIBIOTICS AND WHITE FEATHERS IN POULTS. *Poultry Sci., 33:* 211-212. 1954.—A group of 20 Broad Breasted poults was fed to 4 weeks of age on a mash which included 6 per cent of animal protein concentrates, 43 per cent of soya bean meal and supplementary methionine, nicotinic acid and vitamin B_{12}. The mash showed, on analysis, 28.4 per cent crude protein and 1.63 per cent lysine. At 4 weeks of age the poults had a mean liveweight of 504 g., the feed to gain ratio was 1.91, and no case of white barring of the feathers was seen.

Three parallel groups received the same ration supplemented with procaine penicillin at levels of 4, 20 and 80 p.p.m., respectively. Their

mean finishing weights were 550, 568 and 567 g. and the corresponding feed to gain ratios were 1:79, 1:64 and 1:74. Three further groups received aureomycin in their rations at levels of 10, 50 and 200 p.p.m., respectively, and finished with mean weights of 564, 606 and 568 g., and feed to gain ratios of 1:79, 1:60 and 1:63. None of the birds receiving an antibiotic showed white barring.

It is suggested that field reports of "white barring" as a result of the introduction of antibiotics into poult starting rations may be explained if the rations contain less lysine than in the present experiment, the lysine being then insufficient for the increased growth rates obtained with the antibiotics.—*K. J. Carpenter.* (Nutrition Abstracts and Reviews)

SLINGER, S. J., W. F. PEPPER, and A. M. MORPHET. (Dept. Poultry Husb., Ontario Agric. Coll., Guelph.)

THE PREVENTION OF PEROSIS IN TURKEYS WITH 4-NITROBENZENEARSONIC ACID. *Poultry Sci., 33:* 214-215. 1954.—Two groups of 50 male and 50 female day-old Broad Breasted Bronze poults were assigned to groups by weight, brooded in colony houses with wood shavings as litter, and reared from the eighth to the twentieth week of age in slatted sun porches. The basal starting and growing rations contained animal protein and were given with and without 0.025 per cent 4-nitrobenzenearsonic acid in the mash; as the growing poults received oats as scratch grain, the level of the drug was lower than 0.025 per cent in the total ration. At 8 and 16 weeks of age there was no difference between the groups of liveweight, but at 20 weeks of age the males receiving the drug weighed significantly less than the controls. It is suggested that the difference in the effect of the drug over the age range may be accounted for by the limited access to droppings after 8 weeks of age. Perosis occurred only in the males on the control ration at 16 and 20 weeks of age. 17.7 and 25.5 per cent, respectively, being affected.—*M. J. Head.* (Nutrition Abstracts and Reviews)

SUNDE, M. L., W. W. CRAVENS, H. R. BIRD, and J. G. HALPIN. (U. Wisconsin, Madison.)

THE EFFECT OF COMPLETE AND INCOMPLETE GROWING DIETS ON SUBSEQUENT PERFORMANCE OF THE LAYING HEN. *Poultry Sci. 33:* 779-784. 1954.—Single Comb White Leghorn pullets were raised on a complete starting and growing diet for 2 yrs. Similar groups were fed a diet which did not contain any antibiotic or source of an unidentified growth factor. These complete and incomplete diets were fed for 20 wks. After 20 wks., all pullets were fed a standard laying mash to determine the effect of the starting and growing rations on subsequent performance. No differences in percent egg production, mortality of overall feed consumption, final body wt., or hatchability were apparent. Pullets fed the complete diet were heavier at housing time but gained proportionately less following housing than pullets fed the incomplete diet. Sexual maturity can be delayed 10-12 days with very little change in the diet fed. In spite of the fact that scratch grain made up roughly a third of the total feed consumption from 8-20 wks., the birds fed the incomplete diet made more efficient gains during that period. Overall feed efficiency was about the same. Birds delayed in attaining sexual maturity laid larger eggs initially but gradually the egg wts. of the two groups tended to converge. Delaying the growth rate during the growing period did not lower the subsequent performance except to delay the onset of egg production. When using rations which retard growth, one must start the chicks approx. 2 wks. earlier than would be necessary with a starting and growing ration which permitted max. growth.—*M. L. Sunde.* (Biological Abstracts)

SWART, L. G. (University of Stellenbosch.)

FEEDING SYSTEMS FOR LAYING HENS. *Farming in South Africa 29: 344:* 542-543. 1954.—White Leghorn hens which had almost completed their first laying year were divided into 3 duplicate groups consisting of 35 birds per group. The following three systems of feeding

were tested (1) mash plus scratch grain (2) all mash and (3) mash plus grain ad lib. The mash fed with grain contained 21.4 per cent and the all mash 16.6 per cent protein. The average intake of protein in percentage was 14.2, 16.6 and 13.9 respectively. Those hens on the mash plus grain rations consumed approximately 65 per cent grain and 35 per cent mash. In egg production and total feed consumption there was no significant difference between the different groups of hens during the 357 days test period. Egg production varied from 134.8 for the all mash to 141.9 per hen for the mash plus grain (ad lib) group.—*A. M. Gericke.*

SWART, L. G., and C. R. LIEBENBERG. (Stellenbosch-Elsenburg Coll. Agric., Stellenbosch.)

LUPINS IN CHICK RATIONS. *Farming in S. Africa, 29:* 227-229. 1954.—Sweet yellow lupin seed meal could be used, up to 15 per cent of the total ration for chickens, but it is recommended that not more than 10 per cent should be used, replacing about 37 per cent of the fishmeal normally used. Higher amounts had a detrimental effect on growth and conversion of feed. Bitter blue lupin seed meal, even at a 10 per cent level, proved on unsuitable protein supplement.—*J. S. Thomson.* (Nutrition Abstracts and Reviews)

VIJANDRE, JR., ROMUALDO V. (University of the Philippines, College of Agriculture, College, Laguna, Philippines).

THREE RATIONS FOR GROWING CHICKS COMPARED. *Philippine Agric. 37:* 208-213. 1953.—Rate of growth, feed consumption and cost, and mortality figures in this study show that 5 per cent of the 55 per cent rice bran constituent of the College all-mash chick ration containing 10 parts of dried ground cow manure can be satisfactorily replaced with a corresponding amount of *binlid* and 2.5 per cent of the 5 per cent copra meal ingredient can be replaced with a corresponding amount of mungo meal. The results also indicate that mungo meal cannot effectively replace all the copra meal in the ration.—*F. M. Fronda.*

VILLANOY, RUPERTO A. (University of the Philippines, College of Agriculture, College, Laguna, Philippines).

THE FEEDING VALUE OF TWO GRADES OF SIEVED "KISKIS" RICE BRAN FOR GROWING CHICKS. *Philippine Agric. 37:* 64-75. 1953.—"Kiskis" rice bran passed either through 1-millimeter or 2-millimeter sieves can substitute satisfactorily for "Cono" rice bran in rations for growing chicks. Of the two grades of sieved "Kiskis" rice bran, the finer kind is preferred.—*F. M. Fronda.*

WIETLAKE, A. W., A. G. HOGAN, B. L. O'DELL, and H. L. KEMPSTER. (Dept. Agric. Chem., Coll. Agric., Univ. Missouri, Columbia.)

AMINO ACID DEFICIENCIES OF CASEIN AS A SOURCE OF PROTEIN FOR THE CHICK. *J. Nutrition, 52:* 311-323. 1954.—In a series of trials chicks were fed from hatching to 4 weeks of age on a basal ration made up of casein 35, soya bean oil 10, salts 5, cellulose 3, DL-methionine 0.5, quantities of all the crystalline vitamins known to be needed by chicks, and glucose to 100. If no supplement was given feathering was poor, some chicks developed an abnormal gait and they finished with a mean weight below 150 g.

Performance was much improved when the rations were supplemented with either 1.5 per cent creatine and 0.5 percent, L-arginine or with 10 per cent gelatine at the expense of casein, but was not equal to that obtained with a combined supplement of creatine, arginine and 1.5 per cent glycine. The variability in final bodyweight (with a mean of over 350 g.) was also considerably less with the last ration than with those supplemented only with gelatine or with only arginine and creatine.

Creatine was not essential to optimum performance, as equally good results were obtained with a supplement of 1.24 per cent arginine and 1.5 per cent glycine. There is a suggestion from the results that male chicks require more arginine than females.—*K. J. Carpenter.* (Nutrition Abstracts and Reviews)

WINTER, A. R. (Ohio State U., Columbus.)
FEEDING THE LAYING BREEDING FLOCK FOR MAXIMUM RESULTS. *Amer. Egg and Poultry Review 12:* 18, 20, 50. 1951.—The article gives brief abstracts of research work pertaining to carbohydrates, proteins, minerals, vitamins, antibiotics, grasses and hormones in poultry feeds.—*H. G. Lindquist.* (Biological Abstracts)

PATHOLOGY

CHAMPION, LLOYD R. (Michigan State Coll., East Lansing.)
THE INHERITANCE OF RESISTANCE TO CECAL COCCIDIOSIS IN THE DOMESTIC FOWL. *Poultry Sci. 33:* 670-681. Illus. 1954.—4,151 chicks produced by genetic test matings involving resistant, susceptible, F_1 and F_2 individuals were orally inoculated with 100,000 sporulated oocysts of *Eimeria tenella* at 11 days of age. Details of the prepn. of the inoculum, pre-infection handling of the chicks and percent survivability of all chicks by population are given in detail. The author suggests that it is possible to develop lines of chickens which are resistant and susceptible to cecal coccidiosis. From an analysis of these data it was concluded that sex-linkage, maternal effect or cytoplasmic inheritance do not play a significant role in resistance or susceptibility to cecal coccidiosis. Further, it is hypothesized that resistance and susceptibility to *Eimeria tenella* is controlled, in large part, by multiple genetic factors which do not exhibit dominance and presumably act in an additive manner.—*L. R. Champion.* (Biological Abstracts)

COLES, R., and J. R. UNDERWOOD. 1954. (Nat. Agric. Adv. Serv., Minist. Agric., London.)
HATCHABILITY OF HEN EGGS AND LYMPHOMATOSIS. *Nature [Lond.]:* 877-878.—In the course of work concerned with the breeding of lines resistant to lymphomatosis, it was observed that the incidence of this disease was often highest among the progeny of hens which had the most satisfactory records for egg yield and egg hatchability. The relationship between lymphomatosis and the hatching rate is being investigated. (Animal Breeding Abstracts)

HUGHES, W. F., and D. V. ZANDER. (U. California, Davis.)
ISOLATION AND CULTURE OF HEXAMITA FREE OF BACTERIA. *Poultry Sci. 33:* 810-815. Illus. 1954.—A culture of *Hexamita meleagridis* was obtained by rapid serial transfer of infected turkey gut contents into the allantoic cavity of chicken embryos. Antibiotics were then introduced into inoculated embryos until a bacteria-free culture was obtained. Eight to 12-day old embryos were found suitable for inoculation and the pure culture was maintained by inoculating 10-day-old embryos and harvesting on the 17th day of incubation for subsequent passage. Deleterious effects on inoculated embryos were never observed. *Hexamita* was never found in the gut of unpipped embryos but were found in the gut of chicks which were allowed to hatch.—*D. V. Zander.* (Biological Abstracts)

KLIMES, B. (Agricultural University, Brno, Czechoslovakia.)
BENZINE AS A ANTHELMICUM FOR THE POULTRY. [BENZIN JAKO ANTHELMIKUM U DRUBEZE]. *Veterinarstvi, 7:* 53-58. IV. 1954.—Synthetically produced benzine (PhBs-1-1947) has been given per os to 241 turkeys and 423 fowls for ascaridiasis. 15 turkeys were used in laboratory experiments. Benzine was given in doses from 0.2 to 20 ml per kg b.w. 8 of those animals were killed 20 hours later. During that time the doses 0.2-2.5 ml per kg b.w. were effective 41.96, 97 and 98 p.c. only. The efficiency of higher doses (4.5-20 ml) was 100 p.c. 7 turkeys were killed a week after the application. All the ascaridia (230) were repelled. After the application of benzine at the dosage of 2.5 per kg to 226 turkeys and 423 fowls (from poultry groups were ascaridia and taenia were found in faeces and by section) there were found repelled ascaridia in the faeces. 20 turkeys and 10 fowls were killed 4 days later. No ascaridia or taenia were found in the intestines. No toxic symptoms

could be determined. Benzine—a very inexpnsive remedy—in doses about 2 ml per kg b.w. is to be recommended for further therapeutic clinical trials in the case of helminthiasis in poultry. *(V. Orel)*

KLIMES, B. (Agricultural University, Brno, Czechoslovakia.)
THE PRACTICE WITH THE BENZIN TREATMENT OF POULTRY. [DALSI ZKUSENOSTI S LECENIM BENZINEM U DRUBEZE.] *Veterinarstvi 7:* 215-217. IV. 1954.—Synthetically produced benzine proves to be very effective for the dehelmintization of poultry in doses 2 ml per kg b.w. 9899 poultry fowl were dehelmintizated in the range by the loss of 0.35%. By applying the dehelmintization in practice great care is required to restrict the possibility of benzine aspiration. The symptoms of intoxication after application into the trachea are described.

6994 of dehelmintizated fowls, in different poultry farms, laid 29.004 eggs before the dehelmintization (the maximum period of observation is 10 days). The same fowl laid after the dehelmintization in the same time 30.060 eggs, i.e., 1056 more. From this fact we conclude that the dehelmintization with benzine is in no way harmful for laying eggs. Dehelmintization had a favorable influence on the course of pasteurellosis in the infested poultry farms. *(V. Orel)*

REID, W. M. 1953. (Monmouth Coll., Ill.)
PARASITE PROBLEMS OF STANDARD BREEDS OF POULTRY IN EGYPT. *World's Poult. Sci. J., 9:* 97-101.—Brief reference is made to experiments in progress to test the susceptibility of Barred Plymouth Rocks to *Ascardia galli* compared with that of *baladi* fowls. Preliminary results indicate no difference between the two in the amount of resistance to this parasite. (Animal Breeding Abstracts)

TAYAG, LUDOVICO N. (University of the Philippines, College of Agriculture, College, Laguna, Philippines.)
THE INFLUENCE OF SULFAMETHAZINE ON MORTALITY OF CHICKS RAISED ON BUILT-UP LITTER. *Philippine Agric. 36:* 503-510. 1953.—Mortality in the control lot was more than twice that in the experimental, the control birds needed 5.09 kilograms of feed to produce a kilogram gain, the experimental, only 4.28 kilograms. Sulfamethazine seemed to be effective in the control of coccidiosis, but apparently had little curative effect on roup.—*F. M. Fronda.*

WATERS, NELSON F. (U.S. Reg. Poultry Res. Lab., East Lansing, Mich.)
ETIOLOGICAL RELATIONSHIP OF VISCERAL AND NEURAL LYMPHOMATOSIS. *Poultry Sci. 33:* 365-373. 1954.—Results covering a 13-yr. period are presented showing the occurrence of different forms of lymphomatosis among inbred lines of White Leghorn chickens. In a number of studies, all types of neoplasms in chickens were grouped together and discussed as a single disease. This practice has resulted in conflicting interpretation. Examination of available data suggests that the avian leukosis complex involves a number of distinct disease entities. Evidence was submitted which justifies the belief that naturally occurring neural and visceral lymphomatosis are etiologically different. The low percentage of ocular lymphomatosis and the nearly complete absence of osteopetrosis suggests that these forms are also different. It is suggested that knowledge on avian leukosis would be advanced if the various types involved were reported on separately in future presentations on this subject.—*N. F. Waters.* (Biological Abstracts)

ANONYMOUS.
TEST FOR CRD DEVELOPED. *Western Feed and Seed 9(6):* 42, 54, 55. 1954.—Henry E. Adler, poultry pathologist in the School of Veterinary Medicine, U. of Calif., Davis, announced a two-min. serological test for chronic respiratory disease in poultry. The test is described as are the symptoms of the disease. The control recommended is 100-200 g. of active antibiotic/ton of feed.—*J. F. Harrington.* (Biological Abstracts)

POULTRY PRODUCTS AND MARKETING

BARTOLOME, MARCELO M. (University of the Philippines, College of Agriculture, College, Laguna, Philippines).

THE INFLUENCE OF THE "FLASH-HEAT" TREATMENT ON THE KEEPING QUALITY OF EGGS. *Philippine Agric. 37:* 188-202. 1953.—The "flash-heat" method of preserving table eggs seems to retard a little the deterioration of the eggs. It reduced the loss of weight of the eggs, and the yolks of the treated eggs remained whole a little longer than the untreated eggs regardless of the season of the year. Also, "flash-heating" arrested the development of the germs of the majority of the treated eggs and those that were not killed by the treatment became so weak that it was impossible for them to develop further. The advantages derived, however, do not appear to be significant enough to be of real value.—*F. M. Fronda*

DAWSON, L. E., R. CHAMPION, J. A. DAVIDSON, and H. C. ZINDEL. 1954. (Michigan Agric. Exp. Sta., East Lansing.)

IMPROVING EGG QUALITY THROUGH MICHIGAN R.O.P. BREEDERS—A PROGRESS REPORT. *Poult. Sci., 33:* 293-297.—The egg quality characteristics of (a) albumen firmness, (b) shell thickness, and (c) absence of blood and meat spots, were observed in eggs produced by individual birds in a number of Michigan R.O.P. flocks. Considerable variation in each characteristic was found between strains and between individuals within a strain.

Individual hens were found in each flock which produced superior eggs in 1, 2, or all 3 of these particular quality characteristics. Progeny from the hens producing superior quality eggs will be tested for their egg quality. Families producing eggs of high quality will be maintained and interior egg quality will be used as one criterion in the selection of future breeding hen stock. (Animal Breeding Abstracts)

SWEET, M. C. 1954.

MEAT YIELDS OF TURKEYS ARE COMPARED. From research reported by L. L. Davis and M. E. Coe. *Poult. Process. Market, 60(3):* 13, 24, 26.—Studies by Davis and Coe at Virginia Experiment Station on 80 Beltsville Small White and 80 Broad Breasted Bronze turkeys (40 of each sex and breed) are reported. There appeared to be no relationship between dressed weight and eviscerated yield in B.S.W. turkeys but in B.B.B. the eviscerated yield increased with increasing dressed weight. Evisceration losses varied from 21 to 27% in B.S.W. and 14 to 19% in B.B.B. turkeys; losses were greater in ♂♂ than ♀♀. Raw meat yield (as a percentage of total ready-to-cook weight) was lowest (65.6%) in B.S.W. ♂♂ of 5 lb. 11 oz. av. eviscerated weight and highest (74.6%) in B.B.B. ♀♀ of 11 lb. 9 oz. av. weight. Cooked meat yield (as a percentage of total ready-to-cook weight) was lowest (49.0%) in B.B.B. ♀♀ of 8 lb. 2 oz. av. weight and highest (59.4%) in B.B.B. ♂♂ of 20 lb. 11 oz. av. weight. (Animal Breeding Abstracts)

MANAGEMENT

CAMPOS, A. C., and M. P. CRUZ. (University of the Philippines, College of Agriculture, College, Laguna, Philippines.)

BUILT-UP FLOOR LITTER FOR BROODING CHICKS. *Philippine Agric. 37:* 327-331. 1953.—Old built-up litter may be used to advantage, not only because it is labor saving, but also because it has growth-promoting properties, produces more economical gains in weight than fresh litter.—*F. M. Fronda*

HAVERMANN, H., and R. M. WEGNER (with A. v. BURGSDORFF-GARATH, and H. SCHLUTTER. (Inst. Tierzucht, Univ. Bonn.) English summary.

DIE HALTUNG VON LEGEHENNEN IN BATTERIEN. [KEEPING LAYING HENS IN BATTERIES.] *Arch Geflügelk., 18:* 107-123. 1954.—After a review of the literature on the results of trials

with laying batteries in the United States and Britain, the results of a 10 months' test with a cafeteria-battery of British origin and one made in Germany are reported. They confirm that the advantages of such batteries in Britain hold equally for German conditions. The high cost of the equipment and the relatively small market for table poultry are against the popularity of such batteries in Germany.—*W. Godden.* (Nutrition Abstracts and Reviews)

LAPIS, ROMUALDO P. (University of the Philippines, College of Agriculture, College, Laguna, Philippines.)
THE INFLUENCE OF DRIED COW-MANURE AS LITTER FOR GROWING CHICKS. *Philippine Agric. 37:* 185-187. 1953.—There was little advantage gained from using dried cow manure as litter material over the commonly used rice hull. The use of this material as litter, however, is not advisable considering the labor spent in its preparation.—*F. M. Fronda*

LISSOT, G. 1954.
INCUBATION ARTIFICIELLE. [ARTIFICIAL INCUBATION.] *Ann. Nutr. [Paris], 8:* 143-172.—The history of artificial incubation is traced and experiments leading to current methods are described. (Animal Breeding Abstracts)

MEHNER, A. (Hohenheim.) English summary.
VERSUCHE UBER DIE BEDEUTUNG DES AUSLAUFES FUR DIE GEFLUGELHALTUNG. [IMPORTANCE OF RUNS IN POULTRY KEEPING.] *Arch. Geflügelk.*, 18: 123-140. 1954.—Two series of laying trials were made with groups of 30 laying birds. In the first, 2 groups were confined to houses, one receiving 1 g. cod liver oil per bird daily, and the 2 other groups had free access each to 240 sq. m. of meadow. All birds received daily 50 g. of a mixture of equal parts of milo, maize and oats and free access to a mash. In the second trial there were 5 groups, 3 confined to houses and 2 with access to runs. All groups received grain as above and free access to a mash. Group 1 had a mash with adequate animal protein; group 2 this mash with half the fishmeal replaced by soya bean meal; group 3 was fed as group 2 but with one-third of the soya bean meal replaced by dried whalemeal; groups 4 and 5 received the same mash as group 2.

In the first trial there was no significant difference in the weight of eggs per bird between the groups, but in the second trial the relative weights were 100, 90, 84, 145 and 136 for the 5 groups. In both trials much less mash was eaten by the birds on grass. It is calculated that in a well covered run a bird finds daily 0.5 g. animal protein per sq. m. (*cf.* Abst. 3704, Vol. 11). The 2 trials taken together showed a favorable effect of free run on egg production, and incubator trials showed an improvement in hatching as compared with eggs from birds confined to houses.

Calculations based on saving in feed, increase in egg production, diminution in loss of birds and increased hatch showed that the total effect of the area usually available as range for a single bird, expressed in money value, was about equal to the feed costs for a single bird for 1 year in a house.—*W. Godden.* (Nutrition Abstracts and Reviews)

PANG, RICHARD. (University of the Philippines, College of Agriculture, College, Laguna, Philippines).
THE INFLUENCE OF LENGTH OF GRAZING ON EGG PRODUCTION. *Philippine Agric. 37:* 317-326. 1953.—The birds that were allowed to graze the whole day increased the heaviest in weight and had the lowest mortality. Mortality was highest among the confined birds given no green feed, but the percentage of egg production was higher in this lot than in those allowed to graze in the morning and the confined birds given green feed. The birds that were allowed to graze the whole day produced the deepest orange-yellow color; the confined birds that were not provided with green feed produced pale orange-yellow yolks. A long grazing period favorably influenced the returns and cost of egg production and the size and hatching quality of the eggs produced.—*F. M. Fronda*

RATHORE, G. S. 1950
OBSERVATIONS ON THE BEHAVIOUR OF WHITE LEGHORN FOWLS UNDER DOMESTIC CONDITIONS. *Indian Vet. J., 27:* 32-34. —In Feb. 1949 a cock and 5 hens were transferred from the W.L. flock at the Government Poultry Farm, Udaipur, where they had been kept under ideal conditions, to the City Veterinary Hospital, where they were allowed to wander at will during the day and were fed only ½ oz. grain mixture per bird daily.

For the first 3 mths. the total production of the 5 hens averaged 3 eggs per day; in May the average fell to 2 eggs per day. The moult, which began in June, lasted until the end of Aug., somewhat longer than on the Farm. When the birds came into lay again in Sep. the average for 5 birds was 1¼ eggs per day. While egg size and weight remained unchanged, shell quality was harder, smoother and thicker than that of the Farm birds. Although their egg yield had decreased, the experimental birds were nevertheless better layers than *desi* (native) fowls, and the eggs were larger.

Incidentally, an interesting sidelight was thrown on poultry behavior during the experiment. A Black Minorca hen, which was introduced in June to replace one of the W.L.s which had died, was ostracised by the white birds. She had to be fed apart, and it was some time before the cock would mate with her, and then only when she was away from the other hens. The W.L.s later showed no objection to a White Desi crossbred hen which joined them. (Animal Breeding Abstracts)

VEICMAN, L. N., F. I. LANIN, and O. A. KOLGANOVA. 1953. (Inst. Genet., Acad. Sci U.S.S.R.)
PRODUKTIVNOSTJ I ZIZNESPOSOBNOSTJ CESAROK PRI SODERZANII V KLETKAH. [PRODUCTION AND VIABILITY OF GUINEA-FOWL IN BATTERIES.] *Dokl. Akad. Seljskohoz. Nauk Lenin, 18:* 41-45—At the end of Jan. 1951, forty 7-mth. and forty-three 19-mth. guinea-fowl were put into cages at the State Farm, "Kommunarka." The birds came into production 3 wks. later and controls running free did not come into production until the beginning of April. The moult occurred in Oct.-Nov. in both groups; the battery hens began laying again in Dec. In 365 days the 1st- and 2nd-year guinea-hens produced 146.3 and 120.9 eggs resp. and their free controls of similar ages 100.2 and 97.5 eggs resp. The weight of the eggs of the 1st-year battery hens averaged 45.3 g. v. 47.5 g. for the 1st-year free hens. Mortality was 50% among 1st-year and 32.5% among 2nd-year guinea-hens in batteries v. 61% for White Leghorns in batteries. Results are compared with those of the W.L.s. (Animal Breeding Abstracts)

GENERAL

BAELUM, J. (Natl. Res. Inst., Copenhagen, Denmark.)
POULTRY RESEARCH IN DENMARK. *World's Poultry Sci. Jour. 9:* 255-256. 1953.—Expts. at the Poultry Dept. of the Natl. Res. Inst. and some field trials favor the use of deep litter, also the use of meat scrap and fish meal with vit. B_{12} in laying mashes. The progeny testing station receives pullet progeny annually for testing, under uniform conditions, the progeny of sires throughout the country. Sires are here qualified for entry in the official herd book.—*J. B. Christiansen.* (Biological Abstracts)

BEILBY, O. J. 1954. (Dep. Agric. Scotland, Edinburgh.)
THE IMPACT OF WAR-TIME CONTROLS ON THE SCOTTISH POULTRY INDUSTRY. *World's Poult. Sci. J., 10:* 14-23.—The output of eggs and poultry now accounts for 12% of the value of the Scottish agricultural output compared with 10% before the war. The estimated annual production of 850 million eggs (including domestic and backyard flocks) is over 30% greater than pre-war. Production of poultry meat amounts to 10,000 tons. (Animal Breeding Abstracts)

CAMPOS, AMADO C. (University of the Philippines, College of Agriculture, College, Laguna, Philippines).

COMMERCIAL-SCALE POULTRY PRODUCTION IN CEBU. *Philippine Agric. 37:* 9-15. 1953.—A report of observations made in a number of municipalities and barrios in Cebu. It was observed that the outstanding problem of the poultry industry of the province is the prevalence of diseases. It was suggested that breeding for more resistant stock, proper feeding and management, vaccination, and sanitary measures would help to minimize losses for diseases. For the commercial poultry enterprises to survive in the competitive market, poultry associations and government agencies should work together to stabilize prices and the supply of imported as well as locally produced feedstuffs.—*F. M. Fronda*

DE BEER, J. A. (Glen College of Agriculture, O.F.S.)

CENTRAL EGG LAYING TEST. TWENTY-SEVENTH OPEN TEST AND NINETEENTH R.O.P. TEST. *Farming in South Africa 29:* 345: 576-578, 1954.—In a 48 week test from April 1953 to March 1954 the number of hens and the average production of the different breeds was as follows:

Breed	Open Test No. of hens	Open Test Average prod. per hen	R.O.P. Test No. of hens	R.O.P. Test Average prod. per hen
New Hampshire	14	227.3	—	—
Barred Plymouth Rock	5	219.0	—	—
Light Sussex	12	212.2	10	204.2
White Australorp	12	196.9	—	—
Rhode Island Red	84	220.9	79	220.6
Black Australorp	117	214.9	151	213.2
Silver Legbars	5	174.0	—	—
White Leghorns	129	225.9	176	220.0

The highest individual producer, Black Australorp, Hen No. 177 laid 300 A-grade eggs in 336 days. The average mortality for the entire test was 11.8 per cent. Post mortem examination revealed that mortality was chiefly due to internal haemorrhage and lymphoid leucosis. *(A. M. Gericke)*

DERBAL, Z. 1954.

L'AVICULTURE AU SOUDAN FRANCAIS. [POULTRY BREEDING IN THE FRENCH SUDAN.] *Bull. Tech. Inf. Serv. Agric.*, No. 86: 59-70.—There is no commercial breeding in the French Sudan. In the villages the women keep a few indigenous fowls with a live weight of 500-1600 g. and producing 60-80 eggs per year; egg weight is 30-55 g. The hens rear 6-8 chicks to 1½-2 mths. and then leave them and only 2-3 survive. The fowls are all colours, as no selection is carried out except by a few tribes which prefer black or white birds. Near large centres management and nutrition are better and consequently production is higher; sometimes imported cocks are used and eggs from imported hens are incubated.

Incubators have been adjusted to suit the tremendous variations between day and night environmental temperature. Day-old chicks have been imported each year since the first successful importation in 1950.

There are flocks of guinea-fowl in a semi-wild state near many of the villages. Large numbers of Barbary ducks are bred on the banks of the Niger and Senegal. Turkeys are mostly kept by Europeans, but natives breed them in Bamako, Sikasso and Bougouni. (Animal Breeding Abstracts)

DUNK, M. R.

EXTRA HOUSING WITH A SUMMER LAYING SHELTER. *Poultry Tribune 60(4):* 11. 1954.—Plans are shown for a 24' x 24' summer laying shelter. Plans cover end view, siding framing elevation and floor plan.—*F. P. Jeffrey.* (Biological Abstracts)

ENGLER, H. 1954. (Div. Agric., F.A.O., Rome.)
IMPORTANCE DE L'AVICULTURE SUR LE PLAN MONDIAL. [THE IMPORTANCE OF POULTRY BREEDING IN THE WORLD PLAN.] *Ann. Nutr.* [*Paris*], *8:* 21-52.—Statistics are given of the number of laying hens and av. egg production in various continents and countries in pre-and post-war years. Figures also show imports, exports, consumption and economic value. An 18-page list gives numbers of various species of poultry in different countries. (Animal Breeding Abstracts)

FRONDA, F. M. 1954. (Univ. Philippines, Laguna.)
POULTRY PRODUCTION IN THAILAND. *World's Poult. Sci. J., 10:* 150-154.—There has been much recent emphasis in Thailand on the raising of poultry for profit. There are 3 distinct types, Cantonese, Aseel, and "Kai Jay," the latter being not far removed from the wild red jungle fowl. All types are hardy, but small, slow growers and on the whole poor producers. The Cantonese produce the bulk of market eggs. Of the introduced breeds S.C. White Leghorns and R.I.R.s are most popular. Except on commercial farms where modern methods are used, no special attention is given to feeding and management. The natural method of incubation and brooding is used, but there are some hatcheries with mammoth incubators in the Bangkok area. Disease is prevalent.

The duck industry is well established, there being 2 main types of duck, one with yellow legs and beak and the other with black legs and beak. The centre of this industry is situated in the region round Bangkok and towards the south along the Gulf of Siam. Large flocks are common, and the bulk of the egg supply in the capital is composed of duck eggs. Duck-egg hatcheries are widespread. The marketing of duck eggs is under strict government control. (Animal Breeding Abstracts)

PAUL, D. L. 1954. (Anim. Husb. Vet. Dep. (Livestock), Assam.)
A FEW WORDS ON DUCK-KEEPING IN ASSAM. *Indian Fmg., 4:* 24-26.—In Assam, which has an av. annual rainfall of 160 in., ducks are of considerable importance to rural economy as producers of eggs and meat. At the 1951 census they numbered 1,518,494. About 1937 trials were begun at the Pukra Duck Farm with a view to evolving a utility strain of duck using some of the native types which had good potentialities, but the work could not be completed as the farm and stock were handed over to Pakistan in 1947. However, some information obtained on the 3 local breeds selected for improvement is available. The *Mete* (or *Pati Has*), which resembles the Rouen duck, has an annual egg yield of 100-150, the eggs being white and weighing 1.5-1.8 oz. The live weights of ♂♂ and ♀♀ are resp. 3½-4 and 3-3½ lb. Corresponding figures for the white-breasted *Nageswari* breed are 100-150 eggs (up to 200 not uncommon) weighing over 2 oz., and live weights of 3¼-3½ lb. for both sexes. Egg colour is generally greenish, but some birds lay a snow-white egg. The 3rd local breed was the *Cachar Nageswari*, a dark brown, long-bodied bird, which lays greenish eggs; no further data are reported on it. (Animal Breeding Abstracts)

PESSOA, A. S. 1952.
MISSAO DE ESTUDO NO ESTRANGEIRO. [A STUDY MISSION ABROAD.] *Bol. pecuar., 20:* 81-182.—Various aspects of the poultry industry, including research and improvement, are discussed in relation to Denmark, Holland, Belgium and France. Suggestions for its development in Portugal are made. (Animal Breeding Abstracts)

PROTIN, R. 1954. (Minist. Agric., Paris.)
ETAT ACTUEL ET IMPORTANCE ECONOMIQUE DE L'AVICULTURE FRANCAISE. [PRESENT POSITION AND ECONOMIC IMPORTANCE OF POULTRY BREEDING IN FRANCE.] *Ann. Nutr.* [*Paris*], *8:* 53-68. (Animal Breeding Abstracts)

RAINFORD, A. J. 1954.
THE HATCHING SEASON. *Poult. Ind., 19:* 261, 263.—Results of the 1954 hatching season of the Poultry Production and Progeny Trials

are reported. Hatchability of all eggs set was 72.56%; the figures for heavy and light breeds were 70.76 and 77.69% resp. The percentage of infertile and dead germ eggs was 20.59 for heavy v. 11.92 for light breeds, and hatchability of fertile eggs was 89.11% v. 88.21%. Data relating to 8 breeds are tabulated. (Animal Breeding Abstracts)

RAUCH, W. 1953. (BundesforschAnst. Kleintierz., Celle.) [English summary.]
MATHEMATISCH-STATISTISCHE UNTERSUCHUNGEN UBER DIE LEGELEISTUNG VON HUHNERN. [MATHEMATICAL-STATISTICAL INVESTIGATIONS OF EGG PRODUCTION OF HENS.] *Arch. Geflügelk., 17:* 230-237.—Methods of determining the margin of error to be expected in egg weight determinations based on samples instead of complete daily trapnest records are described. It is stated that errors in the estimation of egg yield can be calculated in a similar manner. (Animal Breeding Abstracts)

TO MEMBERS OF THE WORLD'S POULTRY SCIENCE ASSOCIATION

Notes from the Secretary

Australia—Mr. F. Skaller, Officer-in-Charge of the Poultry Research Centre of the Division of Animal Health and Production of the C.S.I.R.O. at Werribee, Victoria, who represents Australia on the Council of the Association, has very kindly undertaken to collect members' subscriptions in Australia and is busy extending our membership there. In the short time in which he has operated he has been doing good work and has secured eleven new members. He is distinctly hopeful of getting many more. In addition Mr. G. D. Shaw has been looking after our interests in West Australia where he formed a Poultry Science Association in 1940, which has been affiliated to us since that date. We have also 10 members in that State. All this foreshadows the possibility of forming an Australian or State Branches.

Scandinavia—There are now 2 affiliations and 27 members in Denmark, 18 members in Norway and 2 affiliations and 44 members in Sweden. These numbers easily provide a nucleus for the formation of Branches in each country. I hope members will give my suggestion their earnest consideration. If the formation of individual branches presents any difficulty then consideration might be given to the formation of a Scandinavian Branch.

South Africa—Congratulations to Mr. M. S. Letty, Secretary of our South African Branch, on his successful efforts to increase membership. When I first had the pleasure of meeting Mr. Letty at the Tenth World's Poultry Congress,

he told me he was determined that the South African Branch should occupy second place in the Branch membership list. On 15th July, 1954, their membership was 62. Today (10th May, 1955) it is 99, an increase of 37. I am looking forward to their reaching their century.

United Kingdom Branch—The Annual General Meeting of the United Kingdom Branch was held on March 25th and as usual was followed by a Conference. In his Annual Report, the Secretary complained that the paid-up membership which at the end of the year was 386, was not increasing at the rate the usefulness and status of the Branch merited.

At the end of 1953 it was decided to institute an annual essay competition with the purpose of stimulating the interests of students of poultry husbandry. At the same time, it was decided to offer a prize of books to the value of £10.10s. Od. on Poultry Husbandry and cognate subjects approved by the Executive Committee. The first competition was held in 1954 and was won by Miss Helen K. Walker of Loughry Agricultural College, Northern Ireland. This year, in addition to the usual prize of books to the value of £10 10s. Od. the Branch are offering free membership of the Association and the Branch for one year. The subject for this year's competition is "The present systems of poultry education and the means of disseminating knowledge to the poultry industry in the United Kingdom, with suggestions for possible improvements in both."

The theme of the conference was "Feeding Problems for the Poultry Industry." Three papers were submitted by poultry keepers, (Messrs. H. Glasser, L. L. Ogier and E. F. Lutley), who mix their own rations on their farms. An animated discussion followed the submission of the papers and at the end of the discussion Dr. A. Eden, Provincial Nutrition Chemist, National Agricultural Advisory Service, Cambridge summed up.

United States of America—Our Association was formed as a result of the joint efforts of the late Sir Edward Brown and the late Professor James Rice, men of vision and standing in the international poultry world. One of the finest ways in which we can honour and perpetuate their memory is by ensuring that the Association should be the centre of international poultry activities and a forum wherein poultry keepers of every nation could discuss and solve their many problems. That endeavour immediately conjures up Membership. The size of our membership is not worthy of the position the

poultry industry occupies in the international economic structure and it is certainly not in keeping with the hundreds of thousands, aye, millions engaged in it. This appeal for increased membership is addressed directly to everyone engaged in our industry in the U.S.A.

No one more than I recognises and gratefully appreciates the large number of affiliations we have there, but its ordinary membership is not by any means in keeping with the number of people engaged in its poultry industry nor in keeping with the place it occupies in international affairs. I appeal to all our American members and friends to take immediate steps to institute a membership campaign. I have no intention of advising them how to set about that. They are experts in the fields of publicity and propaganda. I would, however, suggest that consideration might be given by members in the various States to the setting up of Committees in their respective States to put the necessary machinery in motion.

While this appeal is made directly to the United States of America, it applies equally to all other countries. Each of our present members can become a recruiting agent. You are a member of the Association because it benefits you. Why not spread the gospel of organization, tell others of these benefits and invite them to share in them.

ADDITIONS TO MEMBERSHIP LIST OF THE WORLD'S POULTRY SCIENCE ASSOCIATION

(Received since last issue)

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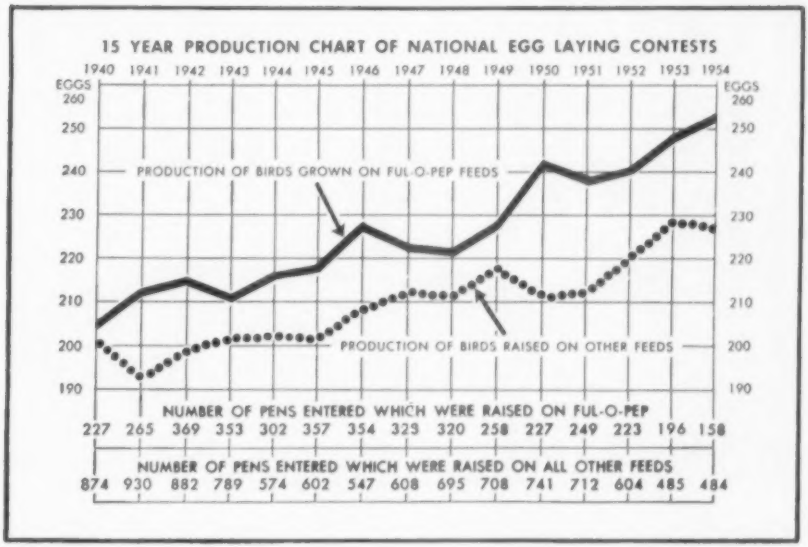
15 YEAR PRODUCTION CHART OF NATIONAL EGG LAYING CONTESTS
1940 1941 1942 1943 1944 1945 1946 1947 1948 1949 1950 1951 1952 1953 1954
EGGS
260
250
240
230
220
210
200
190
PRODUCTION OF BIRDS GROWN ON FUL-O-PEP FEEDS
PRODUCTION OF BIRDS RAISED ON OTHER FEEDS
NUMBER OF PENS ENTERED WHICH WERE RAISED ON FUL-O-PEP
227 265 369 353 302 357 354 329 320 258 227 249 223 196 158
NUMBER OF PENS ENTERED WHICH WERE RAISED ON ALL OTHER FEEDS
874 930 882 789 574 602 547 608 695 708 741 712 604 485 484

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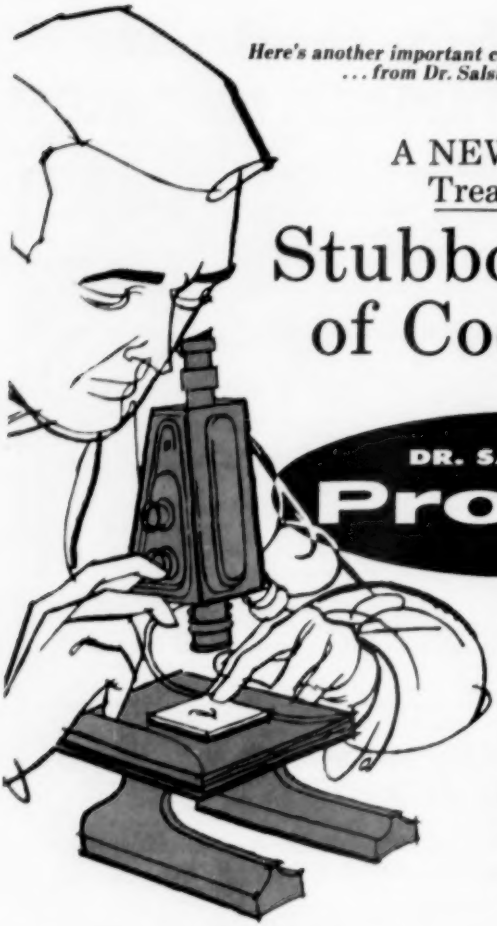

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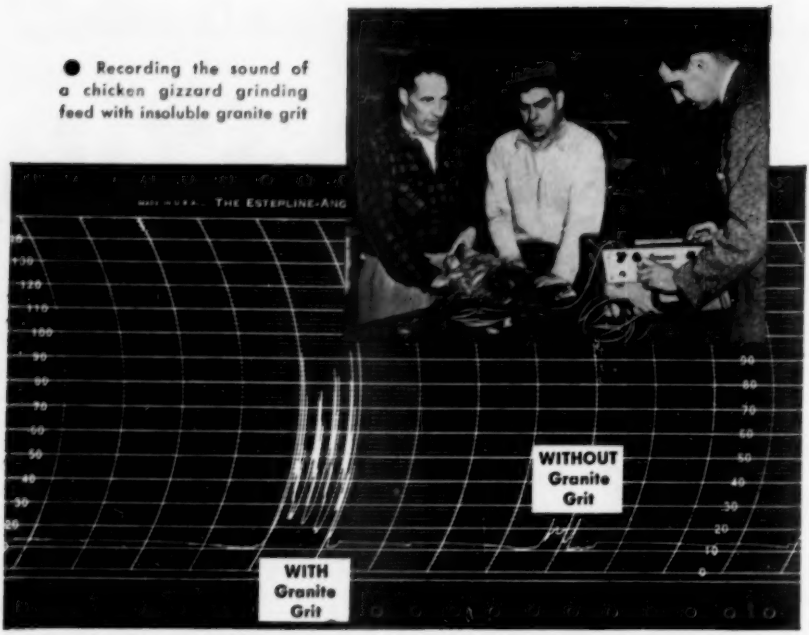

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